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RICHARD P. ROTHWELL, C.E, M.E. } Editors.
ROSSITER W. RAYMOND, Ph.D., M.E. }

Cable Address: "Rothwell," New York.

Books for review and all communications for the JOURNAL should be addressed, Managing Editor, P. O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P. O. Box 1465, New York. Articles written by Mr. Raymond will be signed thus *; and only for articles so signed is he responsible.

London Office: Finsbury Chambers, 76 Finsbury Pavement, London, E. C. Mr. Thomas B. Provis, Civil and Mining Engineer. Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, South America: Mr. John Newton, No. 2 Calle Constitucion, Callao

Australia: Mr. W. Forster, 56 Elizabeth street, Melbourne.

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"MINERAL WAX" AND OTHER MINERALS WANTED.

In answer to our offer to have the value determined of such samples of elaterite, or other "mineral wax" as might be sent to us, we have received a number of samples from different persons, and are having them tested. When their value is ascertained we will communicate with the senders. Some of the samples sent are very fine, and no doubt will be found of very considerable value, possibly 50 cents a pound.

There is a demand for triphylite and lepidolite, minerals containing lithium.

Triphylite is a phosphate of iron, manganese, magnesia, etc., and some samples contain as much as 7 to 8 per cent of oxide of lithium (Li_2O). It has been found at Norwich, Mass. It has a hardness of 5, or between fluorspar and feldspar. A specific gravity of about 3·5. Is greenish or bluish or brownish black in color. Streak grayish white.

Lepidolite, or *lithia mica*, is a variety of mica usually massive or in very small scales, rose color or violet, sometimes white, translucent. It contains about 1¼ per cent of lithium oxide (Li_2O).

If samples are sent to this office they will be submitted to the parties who desire it for export.

Parties having use or a market for vanadate of lead will please communicate with us.

AIR COMPRESSOR LUBRICATION.

Our attention is called to the importance of care in the selection of lubricators for air compressing plant, by a paper recently read before the North of England Institute of Mining and Mechanical Engineers by Mr. Morison. In recent years in England there have been two explosions of receivers of compressed air, which undoubtedly occurred from the ignition of vapor from the oil used in lubrication, and a third case where the excessive heat in the pipe indicated that ignition had commenced. and an explosion was no doubt only avoided by this discovery before the vapor generated from oil collected in the receiver came in contact with the actual ignition. There were also, at least, one if not two, cases of fire at the works on the Croton Aqueduct traceable to the same cause.

The first of these accidents referred to is described as follows: The air compressor supplying the receiver in question was working at a pressure of 57 pounds per square inch, and the receiver consisted of a cylindrical shell with hemispherical ends, the shell being 29 feet long and 6 feet in diameter. The receiver was close to the air compressor. On the night of the accident the attendant had oiled the air cylinders shortly before the explosion occurred. The explosion was accompanied by a loud report, and a large volume of flame was observed to shoot upward and quickly subside, but left some oily matter inside the receiver burning. The flashing point of the oil used here was discovered by the committee appointed to examine into the circumstances to be 365 degrees F.

The conditions of the other explosion were similar to the first, and in the third case referred to, the flashing point of the larger part of the oil was found to be 295 degrees F. and it was found to be a mixture of thickened cotton-seed oil, heavy mineral and light mineral oils. The heavy mineral oil by itself had a flashing point of over 480 degrees F. and was therefore safe if used alone. In this case the receiver was distant from the compressor, and the excessive heat arising from the ignition of the oil collected in the pipe was fortunately discovered where the volume of air was too great to allow of an explosion and before it had traveled to the receiver. The pipe was 6 inches inside diameter, of cast iron, with flanged joints, the joint being made with india-rubber insertion screwed up between the flanges. The receiver was 50 feet from the compressor, and the air compressed to 50 pounds per square inch. The temperature of the air leaving the compressor, when used up to 50 pounds per square inch, was found to be from 320 degrees to 370 degrees F. Two of the pipe joints between the compressor and receiver began to blow, and sparks were blown out, and the pipe in the vicinity of the joints was found to be nearly red hot, and on subsequent examination a charred deposit was found inside the pipe, being the residue of the lubricating oil. The point of ignition of these oils, or, rather, the vapor from them, was apparently not ascertained, and in this respect the report of the committee appointed seems strangely deficient.

There are, however, some very distinct conclusions to be drawn, and which may be laid down as rules which are no doubt attended to by careful users of compressing plant, but which should be adhered to by all. The air receiver should be blown off daily to prevent accumulation of oil in such quantity as to generate a dangerous volume of vapor, and more important still, only pure lard oil, or such special lubricator as is supplied by responsible firms for the express purpose, should be used, and if there is the slightest doubt as to the quality of the article supplied its flashing and ignition points should be ascertained.

NATIONAL FORESTRY.

Since our issue of last week, in which we referred to the serious neglect of the forestry interests of the country, the memorial to be presented to the President by the committee of the American Forestry Congress has been published. This document is bristling with arguments and figures sufficient to convince any one of the damage already done, and certain to ensue if a more energetic policy be not pursued in future, but it fails to point out fully the benefits to be derived and the actual revenue to be collected under an efficient administration of the national forests. We trust, however, that it will not fail in its objects, and it certainly should have weight with the President, as it is a proof that an intelligent body of men, who have given deliberate consideration to the matter, are unanimous and decided in their opinion that the needed reforms are urgent. In the first place, it is clear that disposing of timber lands, as is now done on the same terms as other non-mineral lands, *i. e.*, without taking into account the value of the timber upon them, is simply absurd, and that under this system the nation has given away an immense amount of property. Individuals and corporations have, by means of dummies, obtained, for the trifling survey fees, large tracts of valuable forest land, that should in equity have been paid for at a figure corresponding to its value, or at least should have been subdivided for the benefit of *bona fide* settlers.

In the words of the memorial—

"Worse than this, these great and precious harvest-fields have been reaped in many cases without the preliminary payment of even the smallest pittance required by the Government to secure the fee simple of the land. For years the timber property of the nation has been fraudulently taken, not only by individuals but by corporations, great and small. So long has this been done, and so feeble has been the resistance of the Government, that the public conscience has been demoralized thereby, and when prosecutions of the offenders have been undertaken, it has been almost impossible to secure their conviction, on account of the refusal of witnesses to testify. The records of the land office are very instructive upon this point. They give us the following figures for the last few years":

	Value of timber reported stolen.	Amount recovered.	Appropriation for protection service
1881	$891,888	$41,680	$40,000
1882	2,044,278	77,365	40,000
1883	8,144,658	27,741	75,000
1884	7,289,854	52,108	75,000
1885	2,862,530	49,451	75,000
1886	9,339,679	101,086	75,000
1887	6,146,925	128,642	75,000
	$36,719,935	$478,073	$455,000

These figures are a heavy indictment, but even with the most efficient staff what could be expected from an appropriation of $75,000 to guard such an immense territory from fraud, robbery, and fire. As we mentioned last week, the expenditure of the Indian government upon one comparatively small section of Burmah was $516,345 for last year, and with the result that the government received a net revenue of $593,105, and added largely to the protection of the forests from fire.

A careful examination of the subject leads to the belief that the annual consumption of our forests equals twice the amount of material sup-

plied by their annual growth, as it is estimated that not less than 30,000,000,000 feet B. M. of lumber of all kinds were taken from our forests during the year 1888. This fact, the loss to the nation of from $5,000,000 to $10,000,000 annually by robbery, and perhaps an equal amount by fires, which if not preventible could at least be much reduced by precautionary measures, and the injury done to many districts by drouth, owing to the partial denudation of the mountains in which are situated the sources of the streams, would seem to make it imperative for the government to take some prompt, energetic and intelligent action in the matter.

TRANSMITTING 10,000 VOLT CURRENTS.

The evidence given by Mr. S. de Ferranti, the Chief Electrician and Engineer to the London Electric Supply Corporation, at the Board of Trade Inquiry on the subject of electric lighting in London, is extremely interesting, representing as it does the most advanced views yet put forward regarding the transmission of high tension currents.

We have already in previous issues, November 10th and December 22d, 1888, referred to the gigantic scale of operations projected by this corporation, and in his evidence, Mr. Ferranti stated that they were now erecting at their central station two 10,000 H. P. dynamos, which will give, with the dynamos now ready, a capacity of 250,000 lamps of 10 candle power, in addition to 33,000 lamps at present supplied by their smaller station in London. He further stated that the company had contracted for the erection of further plant, bringing up the total capacity of the works to 450,000 lamps. The company proposes laying down six mains of the concentric conductors, already described in these pages, which are to be carried on cast-iron brackets along the railway, and provided with porcelain or india-rubber supports for the cables.

A large margin is provided in the mains, each having a capacity of 100,000 lights, and the mains are so arranged that any one of them may be thrown into connection with any other at the central station, so that to have a total failure of lighting there must be a break down of both mains and engines at the same time.

The loss of potential in the mains is calculated to be one fifth of one per cent per mile run. With regard to insulation between the inner and outer conductors, Mr. Ferranti has tested the insulating capacity in a number of lengths up to 1,000,000 volts without injuring the insulation in any way. Therefore, with the pressure at which it is proposed to work, viz., 10,000 volts, there would be a safety margin of 100 to 1. The amount of coal required for 100,000 lights of 10 candle power, from the experience gained at the London station now in operation, was 100 tons a day of ten hours with non-condensing engines, but with the engines now erecting at the central station it would be much less. Mr. Ferranti has no fear of any accidents occurring from a leak in the converters by which a tension of 10,000 volts, or even 2400 volts would be brought into the houses, as that is provided against by the use of automatic cut-out apparatus, which would burn out the fuse connecting with the house. The opinion of this expert is distinctly in favor of underground wires. The majority of their mains now in use are overhead, and there has been trouble with the insulation, while at Nancy in France where his system is in operation with underground wires, there has occurred only a single case of defective insulation. Apparently we have something to learn in this respect from Mr. Ferranti. It is proposed to connect to earth at the central station, and to insulate along the line in order not to interfere with telegraph and telephone work. The length of the mains from the central station at Deptford to Westminister, where one of the distributing stations will be, is about seven miles. The test made of the insulation, with a pressure of 1,000,000 volts was made with a Wimshurst machine, giving a 12-inch spark. Mr. Ferranti declined to commit himself as to the value of the alternating current for motor purposes, but said he believed that a suitable motor would soon be available, and that the business of his company was to supply electricity and allow the customer to do what he liked with it. The cost of the mains for seven miles, including excavations where necessary, would be 7 per cent of the cost of the plant.

Sir William Thomson, in his evidence, said that he considered there was great but not insuperable difficulty in working at 10,000 volts pressure and he believed it could be practically carried out. He looks upon a high potential as no more dangerous than a circular saw.

THE COWLES AND HEROULT PROCESSES FOR PRODUCING ALUMINUM.

On another page we print a letter from Mr. Grosvenor Lowrey, the representative of the company owning the Heroult aluminum process, in which he objects to our statements made some time ago to the effect that the Heroult process seems to be taken from the Cowles process. We very gladly now publish the disclaimer of the company that the invention claimed and patented by M. Heroult was "stolen" from the American invention or infringes on the American patents. The high standing financially and socially of some of the stockholders or directors in the company owning the Heroult patents has, of course, nothing to do with the priority of invention of the process or the validity of the patents on the electric smelting processes.

Mr. Lowrey very courteously submitted to us copies of the opinions of eminent patent experts on questions submitted to them, and, as stated in his letter, these gentlemen are unanimously of the opinion that their clients' process differs so essentially from that described in the Cowles patents that it does not infringe on them. The reason chiefly relied on by these patent experts is that the Cowles patents claim the reduction of the alumina by carbon, and the Heroult patent claims it to be effected by electrolytic action, but there is not a word given which indicates that any of these experts have ever established this fact by experiment or that they know of any one else ever having done so.

Most of our readers will remember that the Cowles process consists essentially of a vessel in which an ore of aluminum is mixed with a metal with which the aluminum is to be alloyed and with carbon, and an electric current of such volume is passed through the mass as will melt the metal, and melt and reduce, or reduce and melt, the ore, the aluminum of which then alloys with the metal.

The Cowles patents, or some of them explain, the reaction going on in the furnace as a reduction of the ore by the carbon present and electrical energy, as indeed might naturally be expected.

The Heroult process uses a carbon crucible in the bottom of which is at first a small quantity of the metal to be alloyed, and over it is the carbon electrode through which the electric current passes and which is quite rapidly consumed. The ore and metal mixed are fed in around this carbon electrode, and the aluminum contained in it, as melted, unites or alloys with the metal and falls to the bottom of the crucible, as accurately described in the Cowles patent of August 18th, 1885.

It is true that M. Heroult says in his patent that "the alumina (of the charge) is decomposed by electrolysis into its constituent elements, and its disassociated aluminum unites with the metal used to produce the desired alloy."

It is also true that the several patent experts mentioned in Mr. Lowrey's letter state that the reduction is effected by electrolysis, though none of them states how he knows this to be a fact, and it is not denied that more than sufficient carbon of the carbon anode is consumed to effect the reduction of the alumina. Whatever the method of reduction may be, whether by the reducing action of the carbon or by electrolysis, it seems almost impossible that it should be different in the two cases. In the Cowles process the ore and metal are mixed with the carbon of the electrode, in the Heroult process the ore and metal are mixed and are fed in around the carbon electrode, which in each case is consumed in quantity more than sufficient to account for the reduction of the alumina. The question as to whether the processes are identical seems to us to be a metallurgical one, and not one to be decided merely by the interpretation of the patent claims or explanations of the patentees as to what actually does bring about the common result. Moreover, there are other patents than the Cowles which antedate the Heroult patent and which claim electrolysis as the reducing agent and otherwise closely resemble the Heroult process.

The formidable array of patent experts cited by Mr. Lowrey is fully offset by an equally formidable array of experts on the other side, and several of these have the advantage of being actual experts in the practical operation of the furnace.

So far as the question is one of patent law we express no opinion, but in its metallurgical aspects we have no hesitation in saying that the evidence thus far points to the processes being identical. The mere change in the form of the furnace is not material, for some of the older experiments of the Cowles were made in crucibles very closely resembling the Heroult pot, and Heroult distinctly says in his patent that "I do not limit myself to any particular form or construction of apparatus."

We have again devoted close consideration to this subject since receiving the protests of the Heroult Company against our statement that this process is merely an appropriation of the Cowles invention; and though these further investigations have tended to confirm our opinion as to the metallurgical identity of the two processes, we are quite willing to concede that M. Heroult may have made an independent discovery or invention without knowledge of the previous invention of Cowles and others. It would be simply another example of great minds making independently similar discoveries, many well-known instances of which are on record.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Taylor Plumas Mill and Mining Company.

Editor Engineering and Mining Journal:

Sir: I send you a few items of information to furnish reply to "Subscriber" in your issue of the 13th inst. The election that introduced the new management of this company took place on October 17th, 1887. The

books were handed over showing considerable debt. Legal counsel had to be at once engaged to defend an injunction suit, instigated by the retiring management. The company was called upon to pay back taxes on the property, and for work on the mine for the past two years, as far as funds would permit; to pay salaries, office rent, stationary, Registrar's fees, advertising, etc., etc.

When I add that "Subscriber's" *estimate* of assessments paid in is more than three time the amount received, your correspondent will better understand the company's condition. It remains for the stockholders to improve the value of their interest, if they so desire. Late reports from the superintendent go to show that the possibilities of the mine are fully as good as any other property in this famous gold-producing district. Respecfully yours, L. L. LEVEY, Sec.

NEW YORK, April 25.

The Engineers Hammond.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Referring to a recent article in which you refer to Messrs. "John Hays Hammond, mining engineer," and "J. B. Hammond, millwright," allow me to inform you that the latter has no use for the first initial "J.," on that the former has a monopoly among mining men of the Hammond variety. The "J. B." referred to spells his name *Isaac* B. Then, as I suppose, Mr. Isaac B. is far away, allow me to say of him, as a former partner, and at present, and always a friend, that Mr. John Hays Hammond, M. E., need not be ashamed to be mistaken for Mr. I. B. "*Millwright*," as he, the latter, is a long way ahead of what that term generally implies, having for many years reported on mining properties and superintended large mining and milling operations, and enjoyed the respect of the gentlemen he represented and whose money and property he handled. And as to the "vein" which Mr. John Hays Hammond would not care to indorse, I have not seen the prospectus referred to, but, knowing Mr. I. B. Hammond for an inveterate "bear" on mines, I would say that if he has indorsed a free gold property it must be a good one. Very respectfully yours.

32 OLIVER STREET, BOSTON, April 22, 1889. WILBERFORCE B. HAMMOND.

The Heroult and Cowles Aluminum Process.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The Swiss owners of the Heroult process for producing aluminum alloys have called my attention to certain publications in your journal, which, with a distinctness not to be overlooked, speak of their process as being "stolen" from the patents of Messrs. Cowles, and as having been brought out in Switzerland, probably, for the reason that no law of that country protected inventors until recently. They have asked my intervention to secure them against a repetition of what they considered a grossly mistaken judgment upon the relation of these two processes in the sense of science and of the patent law; expressed in such a way as to be injurious to their interests and their repute as honest men. After the publication of your first article in December last, acting for my Swiss friends, I determined notwithstanding, (1) that the Heroult patent had been issued from the United States Patent Office without "reference" being given to the Cowles patent; notwithstanding (2) that a most thorough patent search made in Europe resulted in finding nothing to impugn the originality and validity of Mr. Heroult's claims; notwithstanding (3) the German patent office (which like our own investigates novelty, and refers the applicant to all domestic or foreign inventions which seem to be the same) has granted patents to both Cowles and Heroult; and, notwithstanding (4) an important syndicate of German bankers and manufacturers headed by Dr. George Siemens, has taken up the Heroult invention, and are building great words to operate it, after full investigation of the legal and economical relations and differences of the two processes; notwithstanding as I say all these evidences that some people think the invention of Heroult is different from and does not infringe that of Messrs. Cowles, I determined to take the opinions of a few experts in electricity and metallurgy, and of one or two lawyers, whose attainments and standing—should they differ with the opinion expressed by you, would be adequate to convince you, that at least the gross charge of stealing, etc., was out of place.

I selected for this purpose as experts, Cyrus F. Brackett, Professor of Physics, Princeton College; J. W. Langley, Professor of Chemico Metallurgy, University of Michigan, and Prof. Frederick P. Dewey, Curator of Metallurgy of the National Museum of Washington, and for the legal opinions, Edward N. Dickerson, Esq., of New York, and B. F. Thurston, Esq., of Providence. The names of the experts were furnished to me by prominent manufacturers and merchants, as being entitled to the highest respect. The lawyers I chose from my own experience, and from a universal *consensus* of opinion in the legal profession that they stand at the head of the patent law bar of the United States. Having received opinions from these gentlemen, I have handed them to you, asking your consideration of the single question whether there is anything in the state of the art or the law affecting the rival claims—if they are rival—of Messrs. Heroult and Cowles, which justifies their controversy—if there is a controversy—being treated except as other controversies are treated, and left to the courts for determination. My friends would not consider it a proper way to conduct a competition in business, to seek from any journal an *ex parte* judgment upon legal questions. In view, however, of the prejudice that may have been created by your former publications, I think it right to ask permission to quote in this letter the conclusions arrived at by the gentlemen above named, having shown the originals to you. As for the grounds of their reasoning, and whether they are correct and thorough, I deem it out of place to either discuss or present those in a newspaper.

I inclosed to each of these gentlemen a letter as follows:

"DEAR SIR: I submit to you United States Patents—
"No. 387,876, of August 14th, 1888, to P. Heroult, and
"No. 319,795, of June 9th, 1885, to E. H. & A. H. Cowles.
"No. 319,945, of June 9th, 1885, to E. H. & A. H. Cowles
"No. 324,658, of August 18th, 1885, to E. H. & A. H. Cowles.
"No. 324,659, of August 18th, 1885, to E. H. & A. H. Cowles.
"No. 335,058, of January 26th, 1886, to A. H. Cowles.
"No. 335,059, of January 26th, 1886, to E. H. & A. H. Cowles.
"No. 360,144, of March 29th, 1887, to E. H. & A. H. Cowles.

And ask your opinion on the following questions:

"First—Does the process claimed in the Heroult patent, 387,876, infringe the claims of any of the others noted above?

"Second—Do you find anything in any of the other patents which anticipates the invention covered by the Heroult claims?

"Third—What, if anything, is the distinctive difference between the Heroult and Cowles methods as respectively disclosed in the above named patents?

"Very truly yours."

Their answers were full, as you will have observed, but I omit from my quotations all statements of reasons and argument, etc., everything but the explicit statement of opinion, deeming it unsuitable to do more than print so much as will indicate that the Heroult claims are not the plain, simple theft of the invention of another which you have indicated. The rest, as I repeat, is for a different tribunal.

Professor Brackett says:

"I have carefully examined the patent of Heroult,—387,876—as well as the others, and I am clearly of the opinion that the process claimed by Heroult does not infringe the claims of any of the others.

"I do not find anything in any of the other patents which, in my opinion, anticipates the invention covered by the Heroult claims.

"The essential differences between the method of Heroult and that of Messrs. Cowles will appear when we observe. . . . The methods then do not differ merely in degree, but radically, in the character of the operations involved."

Professor Langley says:

"I do not find that the Heroult claims infringe the claims of the patents noted above for the following reasons: . . . The Heroult and Cowles patents are, therefore, in respect to the scientific theories underlying them, in the widest possible contrast."

Professor Dewey says:

"I have carefully examined the patents submitted, and in answer to the question have to reply as follows:

"First. The process claimed in the Heroult patent No. 387,876 does not in any way infringe any of the following patents: Nos. 319,795, 319,945, 324,658, 324,659, 335,059, 360,144 to E. H. & A. H. Cowles, and No. 335,058 to A. H. Cowles.

"Second. I do not find anything in any of the claims of the above patents to the Messrs. Cowles which anticipates the invention claimed by the Heroult patent.

"Third. The distinctive difference between the Cowles and Heroult methods as claimed in these patents is, etc.

"There is a considerable number of minor differences between the two processes as claimed, among which may perhaps be appropriately mentioned, etc.

. . . . . .

"Other differences might be stated, but I think these will be sufficient."

Mr. Dickerson says:

"In answer to the first two questions, we have to say that the process described and claimed in the Heroult patent does not infringe any claim in any of the patents of Cowles above enumerated.

"In answer to the third question we say that the fundamental difference between the processes described and claimed in the Heroult patent, and those of the Cowles patents, is this, etc. . . .

"On the other hand, the Heroult process employs no intermediate agency etc."

. . .

"Both methods are modifications of old processes in which an electric current is used to reduce ores; and the novelty of each consists in its peculiar way of utilizing the current for the purpose."

Mr. Thurston says:

"In my opinion the process described in the Heroult patent is plainly and conspicuously distinct from the process set forth in any of the Cowles patents or embodied in any of the apparatus specified in the Cowles patents, and in my opinion the employment of the process described in the Heroult patent is no infringement of any claim, either for method or apparatus, described in the said Cowles patents."

My object will have been accomplished, if I have been able to convince your journal that you have mistaken the character of the gentlemen who are interested in Mr. Heroult's process, and the motive and character of their actions. They are men entitled to be spoken of in all countries of the world with highest respect. As to the intimation of a furtive purpose for experimenting upon, perfecting and finally first setting up their work in their own country, the public who have read your articles should know that these gentlemen are not only among the largest metal workers in the world, (they and their forefathers having resided at Zurich and its neighborhood for generations), one of them being the owner of the water power of the falls of the Rhine near Zurich, at which place the great Heroult aluminum foundry has been established. Perhaps in these circumstances (the residence of these gentlemen, the fact that they needed a great water power for this business, and owned such a one in Switzerland) the public may find sufficient reason for their doing their work there, short of referring it to a desire to escape legal consequences from American inventors, of whom at the time they took up the work, it is likely they had never heard. At any rate, they have not sought to escape legal consequences in other countries, having already set on foot a large establishment in France, where Mr. Cowles' patents were previously in force, and being about to do the same in the United States. GROSVENOR LOWREY.

NEW YORK, April 22, 1889.

ENGLISH COAL MINING STATISTICS FOR 1888.

Through the courtesy of the British Home Office we have received the advance sheets of the Inspectors' reports for the year 1888. The total number of persons in the United Kingdom employed in and about all the mines, exclusive of those employed on private branch railways, and in washing and coking coal, was 578,417, an increase of 10,391 over the preceding year. Of the total number, 5357 were females, employed above ground.

Those employed on private branch railways and in coking numbered 14,239. The total number of fatal accidents was 835 and the number of deaths 960, being an increase of 4 in the number of accidents and a decrease of 91 in the number of lives lost, as compared with the figures of the preceding year. The ratio of deaths to persons employed was 1·660 per 1000, against 1·850 per 1000 in 1887. This death rate is more favorable than in any preceding year, and in this connection it is interesting to note that this is the first year's working under the new regulations, which were the outcome of the report of the Royal Commission on Accidents in Mines.

The number of persons employed in and about the coal, ironstone, fireclay and oil shale mines was 534,945, of whom 3935 were females, working above ground. There were 821 fatal accidents and 888 deaths, the num-

ber of accidents being 9 less and the number of deaths 107 less than in the preceding year. This gives an average of one fatal accident for every 652 persons employed, and one death for every 602 persons.

The total quantity of mineral produced was 182,660,163 tons of 2240 pounds, of which 169,935,219 tons were coal and 8,635,032 ironstone, the rest being fire-clay, oil shale, etc. This shows a total increase during the year of 7,815,407 of coal and 1,065,114 tons of ironstone.

One table is particularly instructive, as showing in the reduced death ratio the steady improvement in the methods of working, as a coal miner's occupation is now more than twice as safe as it was nearly 40 years ago, when inspectors were first appointed. The average ratio for the first 10 years ending 1860 being one death in every 245 persons employed in the coal mines; for the 10 years ending 1870, one death in 300; for the 10 years ending 1880, one death in 425, and for the past year, as already stated, one death in 602. The averages for periods of ten years are more reliable guides than the figures for any single year, when one or two serious accidents or their absence may produce abnormal figures.

There were 222,485 tons of mineral produced for every fatal accident and 205,698 tons for every death, as compared with 208,494 and 173,919 tons respectively in the year 1887. The number of accidents in connection with the supplementary work of branch railways and coking was 6, and the number of deaths resulting 7, being in the ratio of 2373 persons employed per accident and 2034 per life lost.

The number of persons employed in and about the mines, working under the Metalliferous Mines Act, was 43,472, of whom 1422 were females, working above ground. There were 64 fatal accidents and 72 deaths, the number of accidents being 13 more and the number of deaths 16 more than in the preceding year. In this branch of mining there is not the same relative improvement in security for life that is shown in the coal mine statistics, as the ratio was one fatal accident for every 679 persons employed and one death for every 603 persons, while the corresponding averages for the ten years, 1874 to 1883, were 668 and 607 respectively.

The compilation shows good organization in the department, and it is altogether creditable work to be published so soon after the close of the year.

OFFICIAL REPORTS.

PLUMAS EUREKA MINING COMPANY.

The annual meeting of this company was held in London on the 4th inst. The report relative to the operations in the Plumas Eureka Mine, situated in Plumas County, California, for the half year, showed a balance to the credit of profit and loss of £16,994 17s. 8d. out of which the directors recommended a dividend of 2s. per share, free of income tax, amounting to £14,062 10s. Ore to the extent of 28,715 tons was produced, of which 16,429 tons came from the Plumas Eureka Mine, and 12,645 of this came from the Trezona shoot of that mine. The Mohawk mill crushed 28,210 tons of ore, which gave an average yield in free gold of $7.10 per ton, as compared with $7.92 per ton in the preceding half year. The proportionate yield from the sulphurets per ton of ore crushed cannot be stated, as owing to a diminished water supply only a little over one half the sulphurets saved were treated. The cost of mining, with prospecting and dead work, amounted to $3.39¼ per ton, and of milling to $0.58¼ per ton, together making the working expenses $3.98¼, as compared with $3.90 in the previous half year. The quantity of sulphurets saved from the ore milled was 300 tons, but for the reason stated above only 169 tons were treated, at the tailings works, which yielded $3,913.41 (£782), an average of $23.15 per ton. The outside mines have yielded a considerable amount of ore (11,746 tons) during the half year, but principally of poor quality, and a fair amount was developed by explorations.

The report goes a little later than the 31st of December, and since that date more favorable letters had been received from the mines. The quantity of ore milled at the Yuba Mill was about the same as usual—24,279 tons. This mill has been in operation about three years, and the average cost of the work done there during that time was 18s. 6d. per ton, but the expenses during the last half-year had been reduced to 15s. per ton, whilst the earnings of the mill during the last three years had averaged, including sulphurets, 27s. per ton, and during the past half-year it had only averaged 17s. The Eureka mine gave 28,000 tons of ore during the six months, which was the average quantity, and the cost at the Mohawk Mill was 16s. 6d., as against 17s. 6d. in the three preceding years, and the yield had averaged 29s. per ton, as against 23s. per ton the previous three years, showing an improvement of £5000 in the gross income for the last six months.

SIERRA BUTTES GOLD MINING COMPANY.

The thirty-eighth ordinary general meeting of this company was held in London on the 4th inst. The report and balance sheet of the Sierra Butte mine, situated in Sierra County, California, showed a balance of credit for the half year of £12,868 12s. 8d., which the directors recommended to be carried forward. The amount brought forward from the previous account was £10,428 14s. 8d., thus showing the net profit on the half year's working to be £2,439 18s. There is a very large quantity of ore developed in the mine, but, as far as is known, it is principally of low average quality, and consequently the result of the half year's workings is only a small excess over the expenses. The quantity of ore taken out of the mine during the half year was 24,130 tons, the average cost of extracting it, including the usual prospecting and deadwork, being $3.42½ per ton. The Yuba Mill crushed 24,279 tons of ore, at an average cost of $0.26¼ per ton. These two items of mining and milling make the ordinary working expenses $3.68 per ton. The quantity of sulphurets saved at the Yuba Mill amounted to 145 tons, and 153¾ tons were treated at the Chlorination Works, which produced an average of $104.62½ per ton. The average yield of the ore in the Yuba Mill was $3.65¾ per ton, and in the Chlorination Works, $0.62½ per ton on the quantity of ore milled, making together $4.29 per ton, as compared with $4.50 in the preceding half year. Ore from the old waste heaps to the extent of 9140 tons was reduced in the Hanks Mill, and yielded $14,371.67 (£2874), an average of $1.57 per ton. The profit from this ource was $8,054.16 (£1,610). The cost of selecting this ore was 35 cents, and of milling, 35 cents, making the average working cost 70 cents per ton. The prospecting work has been productive of small results in the development of ore of good quality, so that the bulk of the ore at present laid open in the mine is of low grade. Professor Joshua E. Clayton, who made a thorough examination of the property the latter part of September, recommended a more thorough exploration of the North Cliff vein in a westerly direction, where very little work had been hitherto done. In the sixth level the only prospecting work done was the extension of the 17th crosscut, but, as no sign of the northern branch of the vein was met with, it was stopped on reaching a total length from the level of 124 feet. Only ore of a low grade had been extracted from the seventh level, but "as there is considerable virgin ground in this section of the mine, it is possible that an improvement might occur." The most satisfactory feature of the prospecting work of the half year was the discovery of ore in the North Cliff vein, which promised to be of great value to the company. The Uncle Sam mine, situated in the same locality as the other mines of the company, has recently been purchased, it is stated, at a very small cost, and not a single person had had any money out of the transaction except £200, which was given by the company to a gentleman who had rendered them signal services in connection with the purchase. The mine had been purchased out of the money that had accumulated in the reserve funds, after the most careful investigations had been made as to the value of the property, and some considerable outlay will be necessary to thoroughly develop it.

SECTIONAL AIR COMPRESSORS.

We illustrate a sectional air compressor, built by the Rand Drill Company, of this city, for the Batopilas Mining Company, of Mexico. This mine, as is pretty generally known, is situated in a very inaccessible part of the Sierra Madre range of mountains in the State of Chihuahua. This necessitated cutting up the cylinders, frame and wheel into parts, each of which should form a proper mule load.

The illustration shows how the compressor is separated at the joints. The wheel is made in seven parts, each frame in three; the heads and feet of the air and steam cylinders are taken off and shipped separately, as are the crank disks, shaft and pillow-blocks. The cylinders are each in one piece, and the air and steam cylinders are tied by four rods and cross braced with four narrow sole-plates. The bolts for putting the parts together are taper, instead of straight. The capacity of the compressor illustrated is four No. 3 Rand drills, or five No. 2 drills; but in case of less power being wanted at first, the single compressor can be shipped first, with a capacity of two drills, and the other half added afterwards, making the total capacity as above stated. This compressor is a great boon to mining companies operating in mountainous districts, especially in those roadless mountains of Mexico and Central America.

THE EXTRACTION OF GOLD BY LIXIVIATION.

Written or the Engineering and Mining Journal by W. A. Wilson.

(*Continued from page 367.*)

TABLE VII.

OCCIDENTAL ORE—RESULT OF ROASTING IN STETEFELDT FURNACE AND LEACHING IN ASSAY OFFICE.

Number of furnace run.	Per cent. of salt.	Per cent of sulphur.	Per cent of matte.	Amount of heat.	Per cent of silver extracted.	Per cent of gold extracted.
3	0	10	0	Highest possible	89·8	85·5
4	0	5	0	Normal	86·7	84·6
5	10	0	2	High	95·0	78·5
1	0	4	0	Very low	84·1	77·3
2	0	5	0	Low	87·5	77·3
24	1	4	0	Normal	80·0	77·3
22	5	0	0	Medium	93·5	75·7
26	1	4	0	High	84·2	72·7
23	1	5	0	Normal	80·6	72·7
25	1	4	0	Normal	75·3	70·0

TABLE VIII.

OCCIDENTAL ORE—VOLATILIZATION OF GOLD IN ROASTING IN STETEFELDT FURNACE.

Number of furnace run.	Per cent of salt.	Per cent of sulphur.	Per cent of matte.	Amount of heat.	Apparent loss of gold by volatilization.
4	0	5	0	Normal.	0
1	0	4	0	Very low.	10
2	0	5	0	Low.	11
8	0	0	10	Medium.	11·8
7	0	0	10	Medium.	11·8
19	0	2	0	Highest possible.	13·6
12	0	6	0	Medium.	15·8
15	0	6	0	Very low.	16·7
9	0	0	5	Lowest possible.	17·7
13	0	5	0	Normal.	17·7
14	0	2	0	Very low.	22·2
11	0	0	8	High.	22·7
3	0	10	0	Highest possible.	28·0
22	0	12	0	Medium.	31·8
24	0	4 fine.	0	Normal.	36·3
21	0	4 coarse	0	Normal.	40·9
26	1	4 coarse	0	High.	40·9
23	1	5	0	Normal.	41·0
16	0	8	0	Highest possible.	45·4
17	0	6	0	Highest possible.	45·4
25	1	4	0	Normal.	45·4
10	0	0	10	Highest possible.	50·0
18	0	4	0	Highest possible.	54·5
22	5	0	0	Medium.	63·5
6	10	0	2	Low.	64·3
5	10	0	2	High.	64·3

Table VII. gives the results of assay office leaching tests on Occidental ore roasted in the Stetefeldt furnace. The percentages of extraction are

obtained by comparing the value of the tailings with that of the raw ore after making allowance for the addition of salt, sulphur or matte and loss of weight by roasting. A higher percentage of silver could easily have been obtained, but this higher extraction of silver would have been accompanied by a less extraction or greater loss of gold. Sulphur alone gave the highest extraction of gold, 84 per cent to 85 per cent, but only 86 to 90 per cent of the silver. The extraction of silver increased with the percentage of salt used, but that of gold was not much affected. Generally the highest extraction of silver and gold was with a high heat.

Table VIII. gives the loss of gold from Occidental ore by roasting in the Stetefeldt furnace. Only the coarsest portion of the ore, that which fell in the shaft of the furnace, was sampled and used. No ore was taken from the return flue or dust chambers, as none could be obtained, except such as was mixed with Ontario ore, already lying in the return flue and dust chambers. Hence the losses of gold in Table VIII. represent only disappearance of gold from the shaft of the furnace. The fine material which could pass a 30-mesh screen contained about five times as much gold as the remainder. Most of the gold considered as volatilized was, probably, in reality deposited as dust in the dust chambers. There was no perceptible loss of silver. With 2 to 5 per cent of sulphur alone, the apparent loss in gold varied from 0 to 22·2 per cent; but the results are somewhat contradictory owing, probably, to the difference in draught, and, consequently, greater or less amount of gold passing into the dust

TABLE IX.

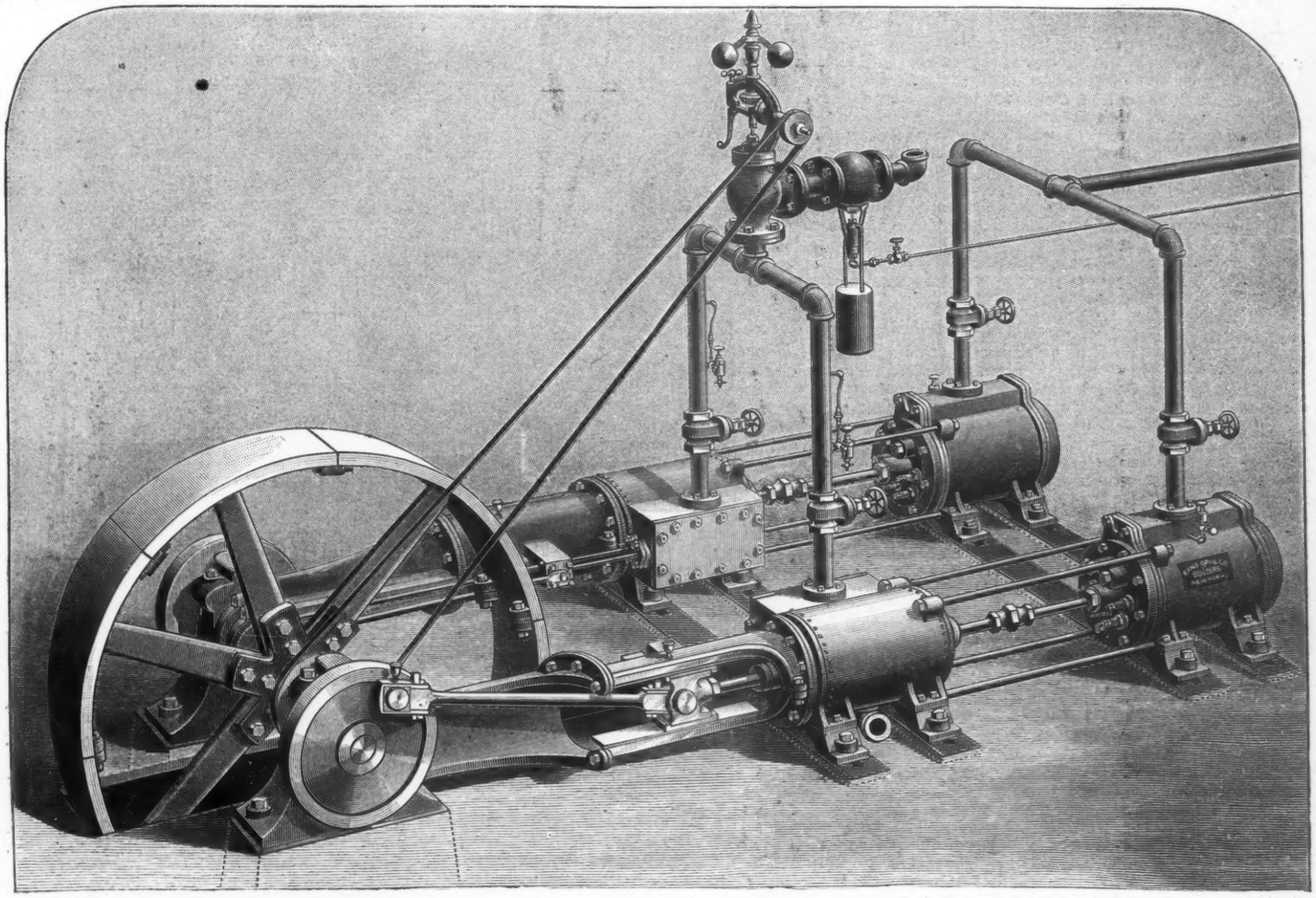
OCCIDENTAL ORE—RESULTS BY LEACHING IN MILL ON ORE ROASTED IN STETEFELDT FURNACE.

Number of Run.	Per cent of silver by leaching in assay office.	Per cent of gold by leaching in assay office.	Per cent of silver by leaching in mill.	Per cent of gold by leaching in mill.	Per cent of total raw ore value extracted in mill.
1	87	53·3	84	51	78
2	87	53·3	87	53·3	78 7

TABLE X.

SARATOGA ORE—RESULTS BY LEACHING IN MILL ON ORE ROASTED IN STETEFELDT FURNACE.

Mesh of screen.	Per cent of salt.	Ounce silver per ton.	Dollars gold per ton.	Per cent of silver extracted in assay office.	Per cent of gold extracted in assay office.	Per cent of silver extracted in mill.	Per cent of gold extracted in mill.
26	20	44·5	3·03	95·6	66·7	96·9	65·8
26	20	48.5	3·51	96·1	71·4	97·3	76·8



SECTIONAL DUPLEX COMPRESSOR.

chambers. The principal value of the table lies in its illustration of the effect of the use of salt, the greatest losses accompanying the highest percentage of salt. In all the experiments on the Occidental ore in the Stetefeldt furnace, the roasting was at the rate of about 75 to 80 tons per day for one furnace.

Table IX. gives the results of leaching tests in the mill on Occidental ore roasted in the Stetefeldt furnace. The material treated in these two runs consisted of a mixture of a number of the roasts made in the Stetefeldt furnace without salt. In some of these roasts the loss by volatilization of gold was very high, and therefore the extractions of gold given in Table IX. are quite low, as the percentages given represent net extractions based on raw ore value, the losses by volatilization being taken into account. If only those roasts had been leached in the mill on which the loss of gold was low, the percentage of gold and the percentage of total raw ore value extracted would have been considerably higher. The main point to be noticed in the table is that the extraction in the mill on the second run, both in gold and silver, agrees exactly with that in the assay office.

Table X. gives the results of two mill runs made on Saratoga ore which had been roasted in the Stetefeldt furnace. By mistake 20 per cent of salt was used in roasting instead of 10 per cent as was intended. A coarser screen might also have been used, but as only one car load of ore (about 1½ tons) was tested it was not considered best to risk making any changes. Before roasting this ore not only the shaft but also the return flue and hoppers were cleaned out and all the roasted ore except that which passed into the dust chambers was used for the leaching tests. Hence the loss in gold by roasting was quite small as compared with that apparently taking place in roasting Occidental ore of which only the ore falling in the shaft was used. No attempt was made to obtain a high percentage of gold from the Saratoga ore as the value of the ore in gold ($3 to $3.50) was quite small as compared with its value in silver (55 ounces). Consequently the extraction of gold is not so high as it might have been had any effort in that direction been made. In both leaching mill runs the extraction of s lver exceeds that obtained in the assay office tests, and in the second run the mill extraction of gold is higher than in the assay office.

Table XI. gives the average extraction of silver and gold from Daly ore roasted in one Stetefeldt furnace at the Marsac Mill. At the time of making the experiment a 20 mesh screen was used on the battery, and the amount of ore treated per day was about 80 tons, requiring about $\frac{1}{10}$ of a cord of wood and $\frac{3}{4}$ of a horse-power to run the furnace. As the value of the gold in the Daly ore is only about $\frac{1}{35}$ of the value of the silver, no attempt is made to get a high percentage of the gold, so that the 57$\frac{1}{10}$ per cent of gold is only what is incidentally obtained. By comparing Table XI. with Table XII. it will be noticed that the extraction of silver is less from Daly than from Ontario ore. This is because the Daly ore contains only about $\frac{1}{3}$ as much sulphur as the Ontario.

Table XII. shows the results obtained on Ontario ore in the Stetefeldt furnace after crushing through various screens; also the amount of ore crushed per stamp per day and roasted by one furnace, and the

TABLE XI.

DALY ORE—ROASTING IN STETEFELDT FURNACE AND LEACHING IN MILL.

Mesh of screen, No	20	Tons of ore roasted per cord of wood.	16
Size of wire, "	26	Horse-power	⅜
Rate of roasting per day per furnace, tons	80	Silver extracted per cent	92·2
Per cent salt used	10	Gold " " "	57 1

TABLE XII.

ONTARIO ORE—ROASTING IN STETEFELDT FURNACE AND LEACHING IN MILL.

Mesh of screen.	Size of wire.	Tons per furnace per day.	Tons crushed per day by one stamp.	Per cent of salt used.	Cords of wood per ton.	Horse-power per furnace.	Labor, including firing and piling.	Per cent of silver extracted in assay office.	Per cent of gold extracted in assay office.	Per cent of silver extracted in mill.	Per cent of gold extracted in mill.
26	32	40	2	16	⅛	⅛	56c.	92·9	52·0	93·6	54·3
20	28	55	2¾	12½	1-10	⅛	48c.	97·0	....	97·0	....
16	26	70	3½	12	1-12	3-5	41c.	96·0	50·0	97·1	52·7
10	23	94	4¾	14	1-16	1	34c.	91·7	52·0	93·4	72·6
6	20	126	6⅓	8	1-20	1½	26c.	93·5	50·0	91·9	77·0

amount of wood, power, labor and salt required in roasting. With one exception the extraction of silver in the mill equals or exceeds that in the assay office, while the extraction of gold in the mill is always greater than in the assay office, the difference increasing with the coarseness of the screen until with a No. 6 mesh screen the extraction of gold is 27 per cent greater than in the assay office. With the exception of the second and third runs, on which no clean-up was made, the mill extraction of gold and silver represent the results of actual clean-up runs. The value of gold in Ontario ore being only $\frac{1}{70}$th that of the silver, no attempt has ever been made to raise the extraction of gold. In running the Stetefeldt furnace on ore crushed through various screens the amount treated in one furnace was limited to the amount which could be crushed by 20 stamps as the batteries at the Ontario are so arranged that only 20 stamps can be connected with one furnace. Therefore the amount treated by one furnace when using screens of various mesh represents only the amounts which can be crushed by 20 stamps and not the greatest amount which could have been treated by one furnace. For instance, one furnace could treat 126 tons per day whether crushed through a 6 or 20 or 30 mesh screen, and the results would probably have been higher with the 20 or 30 mesh than with the 6 mesh.

While using a 6-mesh screen and treating 126 tons the damper in the the flue was at such a point that the flue opening was only 18 inches high, although the damper could have been raised to 4 feet. As the draught in the furnace is regulated by the height of the damper, and the capacity of the furnace generally rises as the draught, it is fairly evident that considerably more than 126 tons per day could have been roasted in in the one furnace, particularly as the furnace showed no signs at all of being crowded. The limit of the capacity of one Stetefeldt furnace for Ontario ore is probably not less than 200 tons per day. As the furnace runs were made at different periods there was considerable difference in the grade and kind of ore treated. The ore treated in the second and third runs contained about 80 ounces silver per ton, 8 per cent lead as galena, 10 to 12 per cent zinc as blende, and about 6 to 8 per cent pyrites. The ore treated in the first, fourth and fifth runs contained from half of 1 per cent to 3 per cent sulphur, and assayed only 40 to 50 ounces silver. In these experiments much less salt could probably have been used without materially lowering the results obtained, but no attempt was made to decrease the salt, as the obtaining of statistics on other points was considered more important. The amount of wood used per ton varied from one-eighth of a cord (63 cents) to one-twentieth of a cord (25 cents), according to the number of tons roasted by one furnace, wood costing $5 per cord, and only five cords of wood being used, whether the roasting was at the rate of 40 or 126 tons per day. The power required is that used in running the screen at the top of the furnace, and varies from ½ to 1½ horse-power, the holes in the screens being made larger in proportion to those used on the battery. The labor required varies from 56 cents for 40 tons per day to 26 cents for 126 tons per day. This includes all labor connected with the furnace, and also the removing and piling of the pulp on the floor. These figures are for such an arrangement of the cooling floor as allows the hot ore to be dumped into a pit.

For wood at $5 per cord, and salt $10 a ton, and estimating the cost of labor, power and the percentage of salt in the table, the total cost per ton for roasting in a Stetefeldt furnace without and with salt is as follows:

	Without salt.	With salt.
For 40 tons per day	$1.20	$2.80
" 55 " "	1.00	2.25
" 70 " "	.85	2.05
" 94 " "	.67	2.07
" 126 " "	.54	1.34

TABLE XIII.

RESULTS FROM LEACHING TAILINGS IN MILL.

Ore.	Silver value per ton.	Gold value per ton.	Per cent silver extracted in assay office	Per cent gold, extracted in assay office	Per cent of silver actually extracted in mill.	Per cent gold actually extracted in mill.
Melrose raw tailings	11·8 oz.	$4.13	42 2	50·	54·2	50·
Ontario tailings.	11·9 "	1.24	30·4	55·	38·8	75·8

Table XIII. gives the results of leaching in the mill on Melrose and Ontario tailings. The Melrose tailings are from concentration, and the Ontario tailings are from roasting and amalgamation, both being charged to the leaching vats without roasting or drying or any other preliminary treatment. The results on Ontario tailings are those obtained from 25 tons leached in the mill. These tailings were obtained by sinking a perpendicular shaft 22 feet deep through the tailings-pits at the Ontario mill, all the tailings extracted from the shaft being taken to the leaching vats. Thus an average 25 ton sample was obtained of all the tailings produced by amalgamation of the Ontario mill for a period of seven or eight years, up to 1884.

The percentage of silver extracted in the mill from Melrose tailings exceeds that extracted in the assay office by 12·2 per cent, while the extraction of gold is the same both in the mill and assay office. In the treatment of Ontario tailings the silver returns obtained in mill are 8·4 per cent greater and the gold 20·8 per cent greater than in the assay office. The figures on Ontario tailings are the results of actual clean-ups.

PART III.—SUMMARY.

As shown in the preceding table the apparent loss of gold in roasting Occidental ore in the Stetefeldt furnace averaged much better than when roasting Ontario, Daly and Saratoga ores. If the finer part of Occidental ore contained much more gold in proportion to the coarser part than the three other ores then the greater apparent loss could be easily accounted for; because, while the Occidental ore was taken only from the shaft of the furnace, the Saratoga ore was taken from all of the furnaces except the dust chambers and the Ontario and Daly from the whole furnace for an entire year.

Table XIV. shows that the finer portion of Occidental ore actually did contain much more gold in proportion than either of the other ores, and that therefore much more of the gold in proportion to the value of the ore passed into the dust chambers than in roasting the other ores.

TABLE XIV.

RELATION BETWEEN FINENESS OF ORE, VALUE IN GOLD AND SILVER AND LOSS OF GOLD BY VOLATILIZATION.

Ore.	Mesh of screen.	Per cent of ore by weight.	Silver value per ton.	Gold value per ton.	Place in furnace from which ore was taken.	Average loss of gold by volatilization.
	Mesh.		ounces.	ounces.		per cent.
Occidental	on 8	20	11 3	·06	shaft.	
"	16	27·7	11·2	·09	"	
"	24	14·1	10·7	·06	"	32
"	30	3·5	11·3	·03	"	
"	through 30	34·7	19·1	·40	"	
Saratoga	on 8	27	35·6	·062	shaft return flue and hoppers	
"	16	19	39·6	·065		
"	24	14·6	38·4	·070		7
"	30	5·1	38·6	·075		
"	through 30	34·3	51·2	·160		
Daly	on 8	25·5	21·2	·030	the whole furnace and dust chambers	
"	16	17·6	25 6	·035		
"	24	17·5	27·8	·040		2 to 5
"	30	4·7	28·6	·040		
"	through 30	34·8	34·2	·050		
Ontario	on 8	34	15·6	·62	the whole furnace and dust chambers	
"	16	16	17 7	·65		
"	24	15	19·0	·70		2 to 5
"	30	4·5	20·4	·75		
"	through 30	30	23·4	·060		

In Table XV. is given a comparision of the gold values of several ores before and after roasting inthe Muffle and in the Stetefeldt furnace. The gold values of Ontario and Daly ores before and after roasting in the Stetefeldt furnace are the average values for the whole year 1888, so that while the roasting in the Stetefeldt furnace caused no loss at all, the roasting in the Muffle of the average battery sample for the whole year caused a loss of nearly 28 per cent of gold from Ontario ore, and about 45 per cent from Daly ore. The tables of Part I. show how large are the losses in the Muffle, and how impossible it is to avoid them.

It has also been shown that in the case of raw ores, from which 40 to 50 per cent can be extracted by raw leaching, an oxidizing roast in the Muffle reduces this to less than 10 per cent, although an oxidizing roast in the Stetefeldt increases the extraction to 85 per cent, and that to get the same extraction as is obtained without salt in the Stetefeldt, a considerable percentage of salt is required in a Muffle roast, and is usually attended with great loss. Also, an ore which yielded no gold at all after roasting with sulphur in the Muffle, yielded 84 per cent with sulphur in the Stetefeldt. The amount of gold obtained from Ontario, Daly and Saratoga ores by roasting in the Stetefeldt and leaching in the mill was greater than was obtained by Muffle roasts, although in the former case no attempt was made to obtain the gold, while special efforts were made in the latter. It also seems that there exists no relation between the amount of silver than can be obtained from a raw or roasted ore, and the extraction of gold from the same ore; that is, a high extraction of silver does not indicate that the gold extraction will also be high and vice versa. Neither is there any relation whatever between the loss by volatilization of silver and that of gold either in the Muffle or the Stetefeldt.

TABLE XV.

COMPARISON OF GOLD VALUES BEFORE AND AFTER ROASTING IN THE MUFFLE AND STETEFELDT FURNACE.

	Gold value of raw ore.	Gold value after roasting in Stetefeldt furnace.	Gold value after roasting in Muffle.
Ontario	$1.28	$1.27	$0.93
Daly	1.44	1.44	0.78
Saratoga	2.89	2.68	2.25
Average	$1.87	$1.79	$1.32

Table XVI. shows that on tailings from concentration, and tailings from an amalgamation after roasting, and for roasted ores the extraction of gold in the mill always equals or exceeds the extraction of gold by assay office leaching tests. The extraction of 6·4 ounces silver and $2 in gold from Melrose tailings which were produced by concentration is of particular importance as showing the results which may be obtained in the treatment of low-grade silver and gold ores by combining concentration and lixivation, the total cost of treating 100 tons of tailings per day being about $1 per ton, and for 200 tons about 70 or 80 cents. A com-

bination of lixiviation and concentration would yield from many ores 80 to 92 per cent of the contents in gold and silver, although neither process alone might yield more than 40 to 50 per cent.

TABLE XVI.

RELATION BETWEEN THE EXTRACTION OF GOLD IN LABORATORY AND MILL TESTS.

Ore.	Extraction of gold. Assay Office.	Extraction of gold. Mill.	Greater extraction in mill than Assay Office.
Melrose—Raw tailings....	50 per cent.	50 per cent.	0·0
Ontario—Tailings.....	55· "	75·8 "	20·8
Occidental—Roasted ore.	53·3 "	53·3 "	0·0
Ontario— " " ..	50· "	77· "	27·0
Saratoga— " " .	71·4 "	76·8 "	5·4

Table XVII. gives the comparison between lixiviation and amalgamation on Ontario and Daly ores for the year 1888. The percentages given are all the results of actual clean-ups for the whole year. The extraction of gold from Daly ore by lixiviation exceeded that of amalgamation by 11·1 per cent, while the extraction by lixiviation on Ontario ore was more than double that obtained by amalgamation.

Table XIII. however shows a still greater difference, the extraction by lixiviation from the Ontario amalgamation tailings for a period of 7 or 8 years yielding about three times as much value in gold per ton as had been obtained from the ore by amalgamation. This was accomplished without any preliminary treatment of the tailings, they being transferred directly from the tailing dams to the leaching vats. The total cost of chemicals in their treatment was 40 cents per ton.

TABLE XVII.

COMPARISON BETWEEN AMALGAMATION AND LIXIVIATION IN THE EXTRACTION OF GOLD.

Ore.	Actual extraction by leaching. Per cent.	Actual extraction by amalgamation. Per cent.	Actual extraction in favor of leaching. Per cent.
Ontario.....	77	32 8	44·2
Daly.....	57·1	46	11·1

THE INTER-STATE COMMERCE ACT.

(*Concluded from page 370.*)

SEC. 12. (*Amended.*) That the Commission hereby created shall have authority to inquire into the management of the business of all common carriers subject to the provisions of this act, and shall keep itself informed as to the manner and method in which the same is conducted, and shall have the right to obtain from such common carriers full and complete information necessary to enable the Commission to perform the duties and carry out the objects for which it was created; and the Commission is hereby authorized and required to execute and enforce the provisions of this act; and, upon the request of the Commission it shall be the duty of any district attorney of the United States to whom the Commission may apply to institute in the proper Court and to prosecute under the direction of the Attorney-General of the United States, all necessary proceedings for the enforcement of the provisions of this act and for the punishment of all violations thereof; and the costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the court of the United States; and for the purposes of this act the Commission shall have power to require, by subpœna, the attendance and testimony of witnesses and the production of all books, papers, tariffs, contracts, agreements, and documents relating to any matter under investigation, and in case of disobedience to a subpœna, the Commission, or any party to a proceeding before the Commission, may invoke the aid of any court of the United States in requiring the attendance and testimony of witnesses and the production of books, papers, and documents under the provisions of this section.

And any of the circuit courts of the United States within the jurisdiction of which such inquiry is carried on may, in case of contumacy or refusal to obey a subpœna issued to any common carrier subject to the provisions of this act, or other person, issue an order requiring such common carrier or other person to appear before said Commission (and produce books and papers if so ordered) and give evidence touching the matter in question; and any failure to obey such order of the court may be punished by such court as a contempt thereof. The claim that any such testimony or evidence may tend to criminate the person giving such evidence shall not excuse such witness from testifying; but such evidence or testimony shall not be used against such person on the trial of any criminal proceeding.

SEC. 13. That any person, firm, corporation, or association, or any mercantile, agricultural, or manufacturing society, or any body politic or municipal organization complaining of anything done or omitted to be done by any common carrier subject to the provisions of this act in contravention of the provisions thereof, may apply to said Commission by petition, which shall briefly state the facts; whereupon a statement of the charges thus made shall be forwarded by the Commission to such common carrier, who shall be called upon to satisfy the complaint or to answer the same in writing within a reasonable time, to be specified by the Commission. If such common carrier, within the time specified, shall make reparation for the injury alleged to have been done, said carrier shall be relieved of liability to the complainant only for the particular violation of law thus complained of. If such carrier shall not satisfy the complaint within the time specified, or there shall appear to be any reasonable ground for investigating said complaint, it shall be the duty of the Commission to investigate the matters complained of in such manner and by such means as it shall deem proper.

Said Commission shall in like manner investigate any complaint forwarded by the railroad commissioner or railroad commission, of any State or Territory, at the request of such commissioner or commission, and may institute any inquiry on its own motion in the same manner and to the same effect as though complaint had been made.

No complaint shall at any time be dismissed because of the absence of direct damage to the complainant.

SEC. 14. (*Amended.*) That whenever an investigation shall be made by said Commission, it shall be its duty to make a report in writing in respect thereto, which shall include the findings of fact upon which the conclusions of the Commission are based, together with its recommendation as to what reparation, if any, should be made by the common carrier to any party or parties who may be found to have been injured; and such findings so made shall hereafter, in all judicial proceedings, be deemed prima facie evidence as to each and every fact found.

All reports of investigations made by the Commission shall be entered of record, and a copy thereof shall be furnished to the party who may have complained, and to any common carrier that may have been complained of.

The Commission may provide for the publication of its reports and decisions in such form and manner as may be best adapted for public information and use, and such authorized publications shall be competent evidence of the reports and decisions of the Commission therein contained, in all courts of the United States, and of the several States, without any further proof or authentication thereof. The Commission may also cause to be printed for early distribution its annual reports.

SEC. 15. That if in any case in which an investigation shall be made by said Commission it shall be made to appear to the satisfaction of the Commission, either by the testimony of witnesses or other evidence, that anything has been done or omitted to be done in violation of the provisions of this act, or of any law cognizable by said Commission, by any common carrier, or that any injury or damage has been sustained by the party or parties complaining, or by other parties aggrieved in consequence of any such violation, it shall be the duty of the Commission to forthwith cause a copy of its report in respect thereto to be delivered to such common carrier, together with a notice to said common carrier to cease and desist from such violation, or to make reparation for the injury so found to have been done, or both, within a reasonable time, to be specified by the Commission; and if, within the time specified, it shall be made to appear to the Commission that such common carrier has ceased from such violation of law, and has made reparation for the injury found to have been done, in compliance with the report and notice of the Commission, or to the satisfaction of the party complaining, a statement to that effect shall be entered of record by the Commission, and the said common carrier shall thereupon be relieved from further liability or penalty for such particular violation of law.

SEC. 16. (*Amended.*) That whenever any common carrier, as defined in and subject to the provisions of this act, shall violate, or refuse or neglect to obey or perform any lawful order or requirement of the Commission created by this act, not founded upon a controversy requiring a trial by jury, as provided by the seventh amendment to the Constitution of the United States, it shall be lawful for the Commission or for any company or person interested in such order or requirement, to apply in a summary way, by petition, to the circuit court of the United States sitting in equity in the judicial district in which the common carrier complained of has its principal office, or in which the violation or disobedience of such order or requirement shall happen, alleging such violation or disobedience, as the case may be; and the said court shall have power to hear and determine the matter, on such short notice to the common carrier complained of as the court shall deem reasonable; and such notice may be served on such common carrier, his or its officers, agents or servants in such manner as the court shall direct; and said court shall hear and determine the matter speedily as a court of equity, and without the formal pleadings and proceedings applicable to ordinary suits in equity, but in such a manner as to do justice in the premises; and to prosecute in such mode and by such persons as it may appoint, all such inquiries as the court may think needful to enable it to form a just judgment in the matter of such petition; and on such hearing the findings of fact in the report of said Commission shall be prima facie evidence of the matters therein stated; and if it be made to appear to such court, on such hearing or on report of any such person or persons, that the lawful order or requirement of said Commission drawn in question has been violated or disobeyed, it shall be lawful for such court to issue a writ of injunction or other proper process, mandatory or otherwise, to restrain such common carrier from further continuing such violation or disobedience of such order or requirement of said Commission, and enjoining obedience to the same; and in case of any disobedience of any such writ of injunction or other proper process, mandatory or otherwise, it shall be lawful for such court to issue writs of attachment, or any other process of said court incident or applicable to writs of injunction or other proper process, mandatory or otherwise, against such common carrier, and if a corporation, against one or more of the directors, officers or agents of the same, or against any owner, lessee, trustee, receiver or other person failing to obey such writ of injunction, or other proper process, mandatory or otherwise; and said court may, if it shall think fit, make an order directing such common carrier or other person so disobeying such writ of injunction or other proper process, mandatory or otherwise, to pay such sum of money, not exceeding for each carrier or person in default the sum of five hundred dollars for every day, after a day to be named in the order, that such carrier or other person shall fail to obey such injunction or other proper process, mandatory or otherwise; and such money shall be payable as the court shall direct, either to the party complaining or into court, to abide the ultimate decision of the court, or into the Treasury; and payment thereof may, without prejudice to any other mode of recovering the same, be enforced by attachment or order in the nature of a writ of execution, in like manner as if the same had been recovered by a final decree in personam in such court. When the subject in dispute shall be of the value of two thousand dollars or more, either party to such proceeding before said court may appeal to the Supreme Court of the United States, under the same regulations now provided by law in respect of security for such appeal; but such appeal shall not operate to stay or supersede the order of the court or the execution of any writ or process thereon; and such court may, in every such matter, order the payment of such costs and counsel fees as shall be deemed reasonable. Whenever any such petition shall be filed or presented by the Commission it shall be the duty of the district attorney, under the direction of the Attorney-General of the United States, to prosecute the same; and the costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States.

If the matters involved in any such order or requirement of said Commission are founded upon a controversy requiring a trial by jury, as provided by the seventh amendment to the Constitution of the United States,

and any such common carrier shall violate or refuse or neglect to obey or perform the same, after notice given by said Commission as provided in the fifteenth section of this act, it shall be lawful for any company or person interested in such order or requirement to apply in a summary way by petition to the circuit court of the United States sitting as a court of law in the judicial district in which the carrier complained of has its principal office, or in which the violation or disobedience of such order or requirement shall happen, alleging such violation or disobedience as the case may be; and said court shall by its order fix a time and place for the trial of said cause, which shall not be less than twenty, nor more than forty days from the time said order is made, and it shall be the duty of the marshal of the district in which said proceeding is pending to forthwith serve a copy of said petition, and of said order, upon each of the defendants, and it shall be the duty of the defendants to file their answers to said petition within ten days after the service of the same upon them as aforesaid. At the trial the findings of fact of said Commission, as set forth in its report, shall be prima facie evidence of the matters therein stated, and if either party shall demand a jury or shall omit to waive a jury, the court shall, by its order, direct the marshal forthwith to summon a jury to try the cause; but if all the parties shall waive a jury in writing, then the court shall try the issues in said cause and render its judgment thereon. If the subject in dispute shall be of the value of two thousand dollars or more, either party may appeal to the Supreme Court of the United States under the same regulations now provided by law in respect to security for such appeal; but such appeal must be taken within twenty days from the day of the rendition of the judgment of said circuit court. If the judgment of the circuit court shall be in favor of the party complaining, he or they shall be entitled to recover a reasonable counsel or attorney's fee, to be fixed by the court, which shall be collected as part of the costs in the case. For the purposes of this act, excepting its penal provisions, the circuit courts of the United States shall be deemed to be always in session.

SEC. 17. (*Amended.*) That the Commission may conduct its proceedings in such manner as will best conduce to the proper dispatch of business and to all ends of justice. A majority of the Commission shall constitute a quorum for the transaction of business, but no Commissioner shall participate in any hearing or proceeding in which he has any pecuniary interest. Said Commission may, from time to time, make or amend such general rules or orders as may be requisite for the order and regulation of proceedings before it, including forms of notices and the service thereof, which shall conform, as nearly as may be, to those in use in the courts of the United States. Any party may appear before said Commission and be heard, in person or by attorney. Every vote and official act of the Commission shall be entered of record, and its proceedings shall be public upon the request of either party interested. Said Commission shall have an official seal, which shall be judicially noticed. Either of the members of the Commission may administer oaths and affirmations and sign subpœnas.

SEC. 18. (*Amended.*) That each Commissioner shall receive an annual salary of seven thousand five hundred dollars, payable in the same manner as the judges of the courts of the United States. The Commission shall appoint a secretary, who shall receive an annual salary of three thousand five hundred dollars, payable in like manner. The Commission shall have authority to employ and fix the compensation of such other employés as it may find necessary to the proper performance of its duties. Until otherwise provided by law, the Commission may hire suitable offices for its use, and shall have authority to procure all necessary office supplies. Witnesses summoned before the commission shall be paid the same fees and mileage that are paid witnesses in the courts of the United States.

All of the expenses of the Commission, including all necessary expenses for transportation incurred by the Commissioners, or by their employés under their orders, in making any investigation, or upon official business in any other places than in the city of Washington, shall be allowed and paid on the presentation of itemized vouchers therefor approved by the chairman of the Commission.

SEC. 19. That the principal office of the Commission shall be in the city of Washington, where its general sessions shall be held: but whenever the convenience of the public or of the parties may be promoted or delay or expense prevented thereby, the Commission may hold special sessions in any part of the United States. It may, by one or more of the Commissioners, prosecute any inquiry necessary to its duties, in any part of the United States, into any matter or question of fact pertaining to the business of any common carrier subject to the provisions of this act.

SEC. 20. That the Commission is hereby authorized to require annual reports from all common carriers subject to the provisions of this act, to fix the time and prescribe the manner in which such reports shall be made, and to require from such carriers specific answers to all questions upon which the Commission may need information. Such annual reports shall show in detail the amount of capital stock issued, the amounts paid therefor, and the manner of payment for the same; the dividends paid, the surplus fund, if any, and the number of stockholders; the funded and floating debts and the interest paid thereon; the cost and value of the carrier's property, franchises, and equipments; the number of employés and the salaries paid each class; the amounts expended for improvements each year, how expended, and the character of such improvements; the earnings and receipts from each branch of business and from all sources; the operating and other expenses; the balances of profit and loss; and a complete exhibit of the financial operations of the carrier each year; including an annual balance-sheet. Such reports shall also contain such information in relation to rates or regulations concerning fares or freights, or agreements, arrangements, or contracts with other common carriers, as the Commission may require; and the said Commission may, within its discretion, for the purpose of enabling it the better to carry out the purposes of this act, prescribe (if in the opinion of the Commission it is practicable to prescribe such uniformity and methods of keeping accounts) a period of time within which all common carriers subject to the provisions of this act shall have, as near as may be, a uniform system of accounts, and the manner in which such accounts shall be kept.

SEC. 21. (*Amended.*) That the Commission shall, on or before the first day of December in each year, make a report, which shall be transmitted to Congress, and copies of which shall be distributed as are the other reports transmitted to Congress. The report shall contain such information and data collected by the Commission as may be considered of value in the determination of questions connected with the regulation of commerce, together with such recommendations as to additional legislation relating thereto as the Commission may deem necessary; and the names and compensation of the persons employed by said Commission.

SEC. 22. (*Amended.*) That nothing in this act shall prevent the carriage, storage, or handling of property free or at reduced rates for the United States, State, or municipal governments, or for charitable purposes, or to or from fairs and expositions for exhibition thereat, or the free carriage of destitute and homeless persons transported by charitable societies, and the necessary agents employed in such transportation, or the issuance of mileage, excursion, or commutation passenger tickets; nothing in this act shall be construed to prohibit any common carrier from giving reduced rates to ministers of religion, or to municipal governments for the transportation of indigent persons, or to inmates of the National Homes or State Homes for disabled Volunteer Soldiers, and of Soldiers' and Sailors' Orphan Homes including those about to enter and those returning home after discharge, under arrangements with the boards of managers of said homes; nothing in this act shall be construed to prevent railroads from giving free carriage to their own officers and employés, or to prevent the principal officers of any railroad company or companies from exchanging passes or tickets with other railroad companies for their officers and employés; and nothing in this act contained shall in any way abridge or alter the remedies now existing at common law or by statute, but the provisions of this act are in addition to such remedies: *Provided*, That no pending litigation shall any way be affected by this act.

(*New section.*) That the circuit and district courts of the United States shall have jurisdiction upon the relation of any person or persons, firm or corporation, alleging such violation by a common carrier, of any of the provisions of the act to which this is a supplement and all acts amendatory thereof, as prevents the relator from having inter-state traffic moved by said common carrier at the same rates as are charged, or upon terms or conditions as favorable as those given by said common carrier for like traffic under similar conditions to any other shipper, to issue a writ or writs of mandamus against said common carrier, commanding such common carrier to move and transport the traffic, or to furnish cars or other facilities for transportation for the party applying for the writ: *Provided*, That if any question of fact as to the proper compensation to the common carrier for the service to be enforced by the writ is raised by the pleadings, the writ of peremptory mandamus may issue, notwithstanding such question of fact is undetermined, upon such terms as to security, payment of money into the court or otherwise, as the court may think proper, pending the determination of the question of fact: *Provided*, That the remedy hereby given by writ of mandamus shall be cumulative, and shall not be held to exclude or interfere with other remedies provided by this act or the act to which it is a supplement.

THE PHONOPORE.

The phonopore is a telegraphing device invented by Mr. Langdon-Davies, of London. Some two or three years ago, he first developed the system of transmitting signals through circuits which in the ordinary sense are not closed. Recent experiments in his laboratory were made through an artificial line of 4000 ohms resistance, and comprised the sending of phonopore messages alone, and of phonopore and telegraph messages simultaneously, in the same wire, and in the same or opposite directions. In one experiment the same wire transmitted a telegraph message and two phonopore messages simultaneously, and the working of the phonopores was perfect, even after the resistance of the line had been increased to 23,000 ohms, when the telegraph messages, which were received by needle instruments, could no more be read. A further experiment was made with a line wire open at both ends, and containing a resistance of 100,000 ohms. In this case the ordinary telegraph could, of course, not be worked at all, but duplex working of the phonopore was perfectly feasible. At St. Pancras, messages were being sent by phonopore between London and Leicester, in both directions, on one of the company's wires, which all the time transmitted ordinary telegraph messages. The London phonopore was joined to the line between two Morse relays about half a mile apart, one at the passenger and the other at the goods station, while the Leicester phonopore tapped the line thirty miles from the nearest telegraph instrument, which is at Derby. Between Leicester and London there are on this wire about six telegraph instruments, and as during operation the continuity of the line is constantly being broken by the working, each instrument is shunted by a phonopore, so that the phonopore messages are translated some six times. We are informed that this method of bridging the telegraph instruments does not in any way diminish the clearness of signals as compared with a continuous wire. The messages were printed on a Morse receiver, which was actuated by a phonopore relay. The phonopore transmitter has a vibrating reed, and the distant phonopore receiver is also provided with a reed in the shape of a stretched steel band, which can be tuned to the same note. By choosing different notes for each set of receiver and transmitter, the signals sent out from a station do not affect the receiver at the same station, but only that at the distant station, and the line can thus work duplex without any difficulty. One of the great advantages of Mr. Langdon-Davies' phonopore is that absolutely no alteration in the line and existing telegraph instruments is required, whilst its working capacity, by the addition of phonopores on either end, is doubled.

The Largest Crane in the World.—At the Chatham dockyard there has been a test by the Admiralty of the largest and most powerful crane ever made. The weight lifted was 240 tons, and the range or radius of the crane is 75 feet 3 inches, and its height is 125 feet.

PERMEABILITY OF CEMENT AND MORTAR.

Professor L. M. Haupt recently presented to the Engineers' Club, Philadelphia, some notes upon the Permeability of Cements and Mortars. He quoted from the recent report of the Board of Experts on the Washington Aqueduct Tunnel. That report says:

"If all of the work could and would be faithfully fulfilled in accordance with the later specifications requiring backing by masonry laid in cement mortar, it would make the tunnel reasonably water-tight; yet it would not prevent all leakage absolutely, and it is difficult to foretell how much water would pass through.

"The head of the water in the tunnel varies from about 75 to 175 feet, and the pressure due to this head from 32 to 76 pounds per square inch. This is an internal pressure, tending to burst the tunnel outward—a direction of force which the tunnel lining is not well adapted to resist; and in an inelastic material like bricks or cement cracks are liable to be developed on the least yielding—which would be almost inevitable if any weak points were left in the filling. But even if it were all filled it must be remembered that both brick and cement are permeable to water. It is well known that bricks are pervious under very ordinary pressure, and experiments have demonstrated that even the best cement is permeable to water and will allow it to percolate under pressure. Mr. James B. Francis, Consulting Engineer of proprietors of locks and canals in the Merrimac River, Lowell, Mass., made some recent experiments on the percolation of water through cement mortar, a record of which was presented to the American Society of Civil Engineers, May 16, 1888. These experiments showed that about 17¼ gallons of water per square foot of surface passed through a thickness of nearly 16 inches of cement in twenty-four hours under a pressure of 77 pounds per square inch. A thinner block would, of course, leak more rapidly in inverse proportion to the thickness. If the brick and cement of the tunnel were of the same thickness and leaked at the same rate, considering only half the perimeter of the tunnel, it would amount to 5,000,000 of gallons in twenty-four hours.

"Mr. Stauffer's experiments, made in the Dorchester Bay tunnel, serve to throw light on the leakage through brick-work. He constructed a bulkhead of brick, laid in cement, 4 feet thick, in a tunnel 10 by 10 feet. He found that under a pressure of 72 pounds per square inch the water percolated through at the rate of 120,000 gallons per day, or 1200 gallons per square foot.

"The experience on the Bostain main drainage works proved that it was not practicable to build brick masonry that was water-tight under a pressure of 64 pounds per square inch.

"At the new Croton reservoir, New York, water under 36 feet head was found to percolate through 26 inches of brick work and 4 feet of concrete.

"The board of experts made some experiments to test the permeability of brick and cement mortar to water under pressure.

"Fig. 2, plate 8, shows a sketch of the device used in making the tests. A wrought-iron pipe 5 inches in diameter and about 15 inches long is closed at both ends by caps screwed on. The cap at the bottom has in it a rectangular hole slightly smaller than the end of a brick. A heavy India rubber gasket, with the same sized opening, is placed at the bottom. In the cap on top of the pipe a smaller pipe enters, which leads from the pump. A pressure gauge is fixed to this pipe so as to indicate the pressure applied. The brick or block of cement to be tested is set upright inside the cylinder, with its end down, the upper cap being removed for that purpose. A good potter's clay is then pressed into the open space around the brick until the clay comes up to the brick. The cap is then placed on and the pump applied.

"A good fair specimen of brick was selected from a pile at the Champion avenue shaft, and under a pressure of water amounting to 80 pounds per square inch for one hour passed 23·4 cubic inches of water. The same brick under trial for a second hour passed 21·3 cubic inches of water. Taking the average of these two experiments, and reducing to the amount of water passed per square inch of exposed area of surface of the brick, it was found to be 2·8 cubic inches. This is equivalent to 1·75 gallons per square foot of surface per hour; or for the whole interior surface of the tunnel, 27,342,000 gallons per day of twenty-four hours.

"For another selected brick, in the first hour under 80 pounds pressure, 46.8 cubic inches of water passed through; and for the same brick in sixteen hours, under only 53·8 pounds pressure per square inch, 344 5 cubic inches passed—equivalent to 1·68 gallons per square foot of surface per hour; or for the interior surface of the tunnel, 26,248,320 gallons per day.

"Blocks of cement mortar were prepared, in the proportion of cement one part and sand two parts—the materials having been obtained from the stock on hand at Champlain Avenue shaft (the same as used in the tunnel). These blocks were allowed to set for twenty-four hours in the air, and were then placed in water, where they remained for five weeks.

"One of these blocks, placed in the testing apparatus and subjected to a water-pressure of 80 pounds per square inch, passed in a time of two and one-half hours 2367·8 cubic inches of water—equivalent to 73·8 gallons per square foot of surface per hour—very far beyond the amount of percolation given by brick.

"A second experiment, under 58 pounds pressure per square inch for one and a half hours, gave a percolation of 874·8 cubic inches of water—equivalent to 45·5 gallons per hour per square foot of surface.

"It is to be noticed from the experiments of Mr. Francis that Portland cement mortar having the same proportions of material as in this case did not transmit the water nearly so rapidly. This was owing in a great degree to the cement; but probably partially to the difference in the quality of the sand, as the sand here used was not of the very first quality. The cement bricks presented an appearance of great porosity, and the result was not altogether unexpected.

"It is to be regretted that the time at the disposal of the board would not allow extensive and conclusive experiments on this subject."

There was some discussion by Mr. Arthur Marichal and others. Mr. Marichal said that the imperviousness of cements is a question of the greatest importance; yet it seems that no steps are taken by manufacturers to improve their products in that direction. The *fineness* is one of the most important considerations, and wherever percolation is prejudicial—as is the case in aqueducts subjected to pressure in dams and in works exposed to sea water—care should be taken to select a very finely ground cement. The manipulation of the mortar will also affect its imperviousness.

ANNUAL REPORT OF THE AMERICAN IRON AND STEEL ASSOCIATION.

Mr. James M. Swank has presented his usual careful and elaborate annual Statistical Report, the most interesting and important figures of which we have already published from advance proofs in the ENGINEERING AND MINING JOURNAL of February 2d.

In his introduction Mr. Swank says: It will be remembered that 1887 was the year of largest production in every leading branch of the American iron trade, and that it was also a year of declining prices, the latter result being in part due to the heavy importations of iron and steel in that year, and in part to the general conviction about the middle of the year that the remarkable industrial and speculative activity of the preceding year and a half could not much longer be maintained, especially the phenomenal demand for steel rails for new railroads. The record made by our domestic iron trade in 1888 has fully verified the unfavorable indications which were so noticeable in 1887. There was a decline in the aggregate production of iron and steel in 1888 as compared with 1887, and there was a further shrinkage in prices, so that, regarded as a whole, the year was not a prosperous one for our iron and steel manufacturers, although production was still very large. The following table shows the production of leading iron and steel products in 1888 in comparison with the figures for the three preceding years.

Net tons of 2,000 pounds. (Except nails.)	1885.	1886.	1887.	1888.
Pig iron	4,529,869	6,365,328	7,187,206	7,268,507
Bessemer steel ingots	1,701,762	2,541,493	3,288,357	2,812,500
Bessemer steel rails	1,074,607	1,763,667	2,354,132	1,552,631
Open-hearth steel ingots	149,381	245,250	360,717	352,036
Open-hearth steel rails	4,793	5,255	19,203	5,261
Crucible steel ingots	64,511	80,609	84,421	78,713
Rolled iron, except rails	1,789,711	2,259,943	2,565,438	2,397,402
Iron rails	14,815	23,679	23,062	14,252
Kegs of cut nails (100 lbs.)	6,696,815	8,160,973	6,908,870	6,493,591
Pig scrap, and ore blooms	41,700	41,909	43,306	39,875

The feature of this table which will first attract attention is the slightly increased production of pig iron in 1888 as compared with 1887, notwithstanding the decreased production of all the other products, particularly Bessemer steel ingots and Bessemer steel rails. Our production of pig iron in 1888 was the largest that we have ever attained. All that was made passed into the hands of consumers, as the statistics of stocks on hand at the beginning and end of the year, to be hereafter presented, will show. The greatest shrinkage in the production of the year was in Bessemer steel rails, and next to this the shrinkage in Bessemer steel ingots is most noticeable.

The importation of pig iron has reached an insignificant figure compared to the domestic production, having been only 197,237 gross tons in the past year against 467,522 gross tons the previous year. The stock of pig iron on hand at the end of the year shows a trifling decrease as well as the consumption compared with 1887. Total supply domestic and imported in gross tons, in 1887, 7,110,299; in 1888, 6,988,888; domestic stocks on hand December 31st, 301,913 tons in 1887; and 1888, at the same date, 300,144 tons, showing an approximate consumption in the past year of 6,688,744 tons against 6,808,386 the previous year.

The decreased demand for Bessemer steel rails in 1888 as compared with 1887 was remarkable, and it was the controlling influence in making 1888 an unsatisfactory year for the American iron trade. With a decreased demand and lower prices for steel rails, a tendency to lower prices in the pig-iron market would naturally result, and in the decline in prices for these two staples all finished iron and products would naturally sympathize. Our total production of Bessemer steel rails in 1888 was 1,386,278 gross tons, against 2,101,904 gross tons in 1887—a decrease in 1888 of 715,626 gross tons, a shrinkage which is greater than our total production of steel rails in 1879, when we made 610,682 gross tons. The decreased production of 1888 as compared with the production of 1887 was 34 per cent. The production in the last half of 1888 was less than in the first half.

But, great as was the shrinkage in our production of Bessemer steel rails in 1888, the shrinkage in their consumption in that year was still greater. Our importation of steel rails in 1888 was less than in 1887. The following table shows approximately, in gross tons, our consumption of Bessemer steel rails in these two years:

Bessemer steel rails—gross tons.	1887.	1888.
Production	2,101,904	1,386,278
Importation	137,588	63,016
Approximate consumption	2,239,492	1,449,294

These figures show a shrinkage in our consumption of Bessemer steel rails in 1888, as compared with 1887, of 790,198 gross tons. No shrinkage in any branch of our iron and steel industries at all, comparable with that above shown in our production and consumption of Bessemer steel rails, has occurred since the collection of the statistics of these industries was undertaken. The leading cause of this shrinkage was the great decline in the building of new railroads in 1888, which was foreshadowed, as already stated, in 1887. In 1888 we built about 7,100 miles of new railroad, whereas in 1887 we built 13,080 miles.

Our production of iron ore in 1888 was the largest in our history, amounting to about 12,050,000 gross tons, against a production in 1887 of about 11,300,300 tons. As usual, the Lake Superior region was in 1888 much in advance of all other sections of the country in its production of iron ore, the total shipments from this region amounting to 5,023,279 gross tons, which were the largest in its history. Of this total the Marquette range shipped 1,921,525 tons; the Gogebic range, 1,424,762 tons; the Menominee range, 1,165,039 tons; and the Vermillion Lake district, 511,953 tons. In 1887, the next most productive year in the Lake Superior region, the total shipments amounted to 4,738,903 tons. The improvement in the shipments of the Lake Superior region in 1888 was

largely due to high ocean freights on foreign ores, which reduced importations to about one-half the importations in 1887, and partly to favorable lake and railroad rates, which facilitated shipments to distant markets. The shipments of Lake Superior ore in 1888 to furnaces in Eastern Pennsylvania and New York amounted to about 276,000 tons, of which 246,850 tons were delivered at Buffalo and about 30,000 tons at Erie. Shipments of iron ore from these ports to eastern furnaces in 1887 and preceding years were comparatively small.

SOLUTIONS OF CAUSTIC SODA AS TRANSMITTERS OF HEAT.

Experiments have been made by Ing. Paslo Orlando, who wished to ascertain whether concentrated solutions of caustic soda heated to boiling could, in virtue of the heat stored up in them, be employed for the evaporation of liquids, and as a preliminary step in this investigation, he deemed it desirable to determine the boiling points and specific heat of caustic soda solutions of different degrees of concentration. For this purpose weighed quantities of the caustic soda solutions were raised to the boiling point in a detached portion of the calorimetric apparatus, and this was then replaced in the calorimeter, which contained in each experiment a weighed quantity of water of known temperature. The gain in temperature of the water and the loss in temperature of the boiling soda were noted simultaneously by means of two thermometers; other necessary facts were also registered, and by means of a formula given in the original paper, the specific heats in Table II. were calculated.

TABLE I.—BOILING POINTS OF SOLUTIONS OF CAUSTIC SODA OF DIFFERENT STRENGTHS.

Weight of water to 100 of salt.....	40	50	60	70	80	90
B. P. in deg. Centigrade.....	185·5	174·5	165	159·5	154	149
Weight of water, etc.....	100	140	180	220	260	300
B. P. in deg. C.....	144	130	122·5	117	113	110·3

TABLE II.—SPECIFIC HEAT OF SIMILAR SOLUTIONS OF CAUSTIC SODA.

Boiling point of solution. Deg. Centrigrade.	Weight of 1 m.c. at 15 deg. C.	Specific heat in calories.
112	1400	0·931
124	1412	0·909
136	1427	0·861
143	1467	0·806
151	1493	0·781
158	1513	0·743

These figures lead to the conclusions: (1) That the boiling point rises, while the specific heat falls with increasing concentration. (2) That, nevertheless, the solution must be as concentrated as possible, in order to obtain the maximum amount of available heat; for although the specific heat decreases as the boiling point increases, yet when equal volumes of the solutions are taken into consideration the available heat will be found to increase, on account of the greater specific gravity of the more concentrated solutions, in spite of the evident decrease in temperature observable in the above experiments. (3) That with equal weights the heat yielded by 100 kilos. of the soda solutions increases in the proportion of 65·7 calories for every rise of one degree in the boiling point.

As might be expected, the fluidity of the solutions decreases with the concentration, and also with diminished temperature; thus the solution boiling at 169 degrees remains semi-fluid at a high temperature, but solidifies completely on cooling. Honigmann speaks of using a solution of caustic soda boiling at 220 degrees, in his experiments with the fireless locomotive; but the author has never been able to obtain such a solution, although he has followed various methods of concentration. When employing solutions of caustic soda for the evaporation of a liquid, a difference of from 20 degrees to 25 degrees was always observed between the temperature of the solution and that of the liquid undergoing evaporation. This demonstrates that the transmission of heat is very imperfect, and the author attributes this defect to feeble and sluggish circulation in the soda solutions on account of their great density.

He points out, in conclusion, that although the boiling point of water may easily be raised to 200 degrees or more, it is only with difficulty that a temperature of 158 degrees can be exceeded with solutions of caustic soda. Further, that the quantity of disposable heat stored up by water will always be greater as the temperature of the boiling point is raised.

REPORT OF FRENCH COMMISSION ON EXPLOSIVES.

From our French contemporary, *La Houille*, we take the following official report of M. Haton, Director of the School of Mines, on the experiments with new explosives undertaken by the joint Commission of mining and military engineers appointed by the French Government.

The experiments fully established the danger arising from the use of black powder in fiery mines. With dynamite the danger is diminished, and may disappear altogether with good tamping and a large amount of unfissured material to dislodge. The safest explosives are those binary compounds formed of mixtures with a base of nitrate of ammonia. In the Department of the Nord the National Commission intrusted M. François, Chief Engineer of the Anzin coal mines, with the duty of ascertaining the practical value of three new explosives.

1st. A mixture of dynamite and nitrate of ammonia.

2d. A mixture of octometric gun-cotton and nitrate of ammonia.

3d. A mixture of binitrobenzine and nitrate of ammonia.

These several explosives can be detonated by means of a cap containing 1·50 grams of fulminate of mercury, and even by ·50 grams of fulminate for the mixture No. 1. The explosion can be effected either by electricity or by fuse.

Since nitrate of ammonia costs only one franc per kilogram, and the explosives containing a very large proportion of it, the average price per kilogram would be much less than that of dynamite (six francs). With the actual government duty on explosives the cost of powder would be lower. Unfortunately the bulk of the new explosives for the same force will be much greater, and consequently a larger and more expensive drill hole will be required. The question is different in the case of rock mining, where the new explosives can be employed advantageously. Mr. François has no doubt of this advantage at Anzin, as with a single large hole in the middle of the gullery a sufficient excavation is often made, and with vastly improved security.

The Commission also calls attention to the dangers arising from so-called safety fuse, from the projection of the flames which it gives at the lighted extremity, from the tearing of the fuse, and especially from direct contact of the fuse with the explosive, which itmay ignite before detonating and produce at the moment of explosion a flame liable to ignite fire-damp. The Commission considers these dangers so serious that it recommends the use of friction matches, or ignition by electricity with weak currents, so that there may be no danger of the electric spark igniting the fire-damp.

Chrome Iron Ore as a Furnace Lining.—F. Valton reports in the *Génie Civil* that Alexander Pourcel has succeeded at the new basic open-hearth steel works of Bell Brothers, of which Sir I. Lowthian Bell is a member, in producing from Middlesborough pig carrying 1·7 per cent of silicon and as much phosphorus, steel with as low as 0·03 per cent of phosphorus. The lining of the furnace is chrome ore.

Highest Water-Power Head in the World.—France claims the honor of utilizing a higher water pressure than that recently put in operation in the Chollar shaft on the Comstock lode, in Nevada. At Brignoud, two kilometers from the valley of Grèsivaudad, near Grenoble, a turbine 9 feet 10 inches in diameter was put in operation in the year 1875, utilizing a head of 1638 feet. It is still working, and gives a force of 1500 H. P., with a flow of 300 litres of water per second.

A Photographing Phonograph.—M. Leon Esquille, a Mexican, it is stated, has perfected a marvellous invention in electricity and photography. By speaking in a photophone transmitter, which consists of a highly-polished diaphragm, reflecting a ray of light, this ray of light is set into vibrations, and a photograph is made of it on a traveling band of sensitized paper. Now comes the wonderful part. If the image of this photographic tracing is projected by means of an electric arc or oxy-hydrogen light upon a solenium receiver, the original speech is then heard. It is evident that there is no limit to the development of this peculiar combination of methods.

Change Effected in Copper Conductors by Electric Currents.—The fact which thus seems to be fairly well established that under the action of long-continued currents the molecular structure of copper tends to assume the condition of electrolytically deposited metal would seem to point to the use of conductors built up by the same process, in which case we might assume that there would be no further tendency to an alteration of texture. But it unfortunately happens (unless we are mistaken) that the electrolytically deposited wire at present in the market has its fibres laid transversely and not longitudinally, so that it would not possess any advantage in this particular. We shall be glad to be corrected if we are wrong in this assumption; and in any case it is scarcely possible as yet to say what amount of practical importance attaches to the question.

Germany's Stock of Gold.—According to a recent calculation of Mr. Haupt, the amount of gold coined in Germany to the end of 1888 was of the value of 2,226,000,000 marks, in which is included 310,000,000 marks, remelted; of the former amount there is 26,000,000 marks lying in foreign banks, and Mr. Haupt therefore estimates the stock of gold coins in Germany at 1,890,000,000 marks, so that inclusive of the bar gold in the Reichsbank there must have been 2,326,000,000 marks in hand at the end of 1888, as compared with 1,830,000,000 marks three years ago. There was therefore in Germany at the end of 1888 47 marks gold per head of the population, and only 18 marks silver. The data upon which these calculations are based were perhaps in some respects too favorable, but as they have been made on the same system for the last three years, the increase, at any rate, may be accepted as being accurate. Without a doubt the gold stock of Germany has increased so considerably that she can now regard bi-metallic attacks with indifference.—*Kulows.*

The Wood-Oil Industry of Sweden.—The industry of manufacturing oil from wood becomes every year more and more important in Sweden. Those parts of the timber which have hitherto been supposed to be useless, such as the stumps and the roots, are no longer left in the forests, but are subjected to various processes by which not only wood-oil, but turpentine, creosote, acetic acid, charcoal, and tar are obtained from them. *La Nature* states that the wood-oils now commonly produced in Sweden cannot be burned in ordinary lamps, as the great quantity of carbon which these oils contain makes them smoke. They need special lamps, not unlike the ordinary photogene lamps, which latter can easily be adapted to the use of wood oil. Mingled with photogene in certain proportions, the wood-oil can even be employed in ordinary lamps. It costs 55 centimes the litre. It is not liable to explode, and lasts a very much longer time, during consumption, than photogene. The wood-oil for lamps is almost entirely manufactured from pines and firs. In Sweden there are about thirty factories, producing nearly 40,000 litres of wood-oil.

Volumetric Method of Determining Manganese.—A. Ghilian.—The hydrochloric solution of the substance containing the manganese in the manganous state diluted with boiling water is poured into an Erlenmeyer flask holding from 900 to 1000 c. c., and mixed with an excess of zinc oxide suspended in water. The liquid is made up to 500 to 600 c.c., by means of boiling water and the standard solution of permanganate is slowly dropped in from a Mohr's burette, agitating after each division, and causing the oxides to settle by slanting the flask. The color of the clear supernatant liquid shows the precise moment when it is colored by an excess of permanganate. From the volume of permanganate employed the proportion of manganese is calculated. In the treatment of irons, steels, Bessemer metal and ores, whose proportion of manganese does not exceed 3 to 4 per cent, the author uses a solution containing 4 grms. permanganate per litre, the value of which is 0·000213 per $\frac{1}{10}$ c.c. (*i. e.*, for one division of the burette). A solution of double the strength is employed for the determination of spiegels, ferro-manganese and rich ores. Its value is 0.000,426. Twenty-five such assays may be executed in half an hour. The zinc oxide employed ought to be the kind obtained by precipitation. During the operation the liquids should be kept at about 80 degrees.—*Revue Universelle des Mines et de la Metallurgie.*

Gold Dust Swindle in Russia.—An ingenious gold dust fraud is the latest addition to the long list of swindles. It is forbidden by the Russian Criminal Code to buy or sell gold in its raw form, as it is procured

by the Government from the Siberian mines, and sold direct to gold workers. It is also forbidden to export gold from Russia, except under special license. This law has been recently taken advantage of by a company in a seaport of Northern Russia, which undertook to deliver quantities of gold dust to well to-do persons at half the market value; this being smuggled over the frontier as passengers' luggage. Many persons have been victimized by being at first given a little pure gold dust, but second and larger quantities were found out to be brass filings. One gentleman, who had been "sold" to the extent of 15,000 roubles, remonstrated and threatened exposure, but he only received a number of letters to the effect that, as the Russian law forbade the traffic in gold, he could not take proceedings in Russia. His correspondents even quoted a decision of a Russian Court of Law in a similar case, and invited their dupe to recoup himself by entering into the business as a partner, and inducing other people to buy Russian gold dust. Now that this gentleman, a Vienna nobleman, has exposed the scheme, the swindlers are not likely to conduct further operations in his neighborhood for a while.

The Canals of Mars.—As to the nature of the canals, it is still more difficult to suggest any satisfactory explanation. Several hypotheses have been presented, none of which appears entirely to meet the case. I have already remarked that there has not been lacking the suggestion that these curious streaks represent the lines of actual artificial watercourses on Mars. The straight and undeviating course which they pursue might be regarded as lending some degree of probability to such a view, but the enormous scale on which they exist seems to compel the rejection of the hypothesis. It is true that, if we consider only the influence of the force of gravity on Mars, giants could dwell upon that planet whose mechanical achievements might vastly surpass the greatest performances of our engineers; for a body weighing a ton on the earth would weigh only seven hundred and sixty pounds on Mars, and, on the other hand, a man on Mars possessing relatively the same activity as one of us might be fifteen feet tall and strong in proportion. But, even granting the existence of such a race of Goliaths on our neighbor world, it is not conceivable that they could have constructed a system of tremendous canals over half the surface of their planet, or that they would have done it if they could. The canals of Mars are enormously disproportioned in magnitude to the most gigantic inhabitants that a due regard for the law of gravitation would suffer us to imagine there.—*From "The Strange Markings on Mars," by Garrett P. Serviss, in the Popular Science Monthly for May.*

Spectroscopy in Chemical Physics.—The results of recent spectroscopic researches, as announced by Mr. William Crookes in an address to the London Chemical Society, are decidedly startling.

Ten years ago didymium was universally recognized by chemists as an element. But in that year the new metal decipium was separated from it, and since then it has been demonstrated by spectroscopy that didymium is an aggregation of many allied bodies. In the case of erbium, which not many years ago was also regarded as an element, the spectroscope shows that it is a mixture of seven, and perhaps eight, constituents. Speaking of yttrium Mr. Crookes says: "I have come to the conclusion that it may be split up certainly into five, and probably into six, constituents."

Fortunately the dismemberment of many bodies which were supposed to be elementary does not interfere with their utility in the arts. A "compound molecule," as Mr. Crookes says, "may easily act as an element." But the researches to which we refer, important as they are to chemical science, strikingly illustrate the exceeding value of spectroscopy, now less than a quarter of a century old, yet so developed as to light the scientist's way into the mysteries of atoms and into the constitution of celestial masses. Mr. Crookes cannot be accused of exaggeration when he names the spectroscope as "the most important scientific invention of the latter half of this century."

Metallic Sodium Manufactur in England.—The Alkaline Reduction Syndicate, Limited, say *The Chemical Trades' Journal*, have leased 10 acres of land belonging to Charles Tennant and Partners, chemical manufacturers at Hebburn, and adjoining the Tharsis Copper Works at the same place, for the purpose of producing metallic sodium by a process patented by Captain Cunningham. The Alkaline syndicate also propose treating certain refractory metalliferous ores, and have already commenced the construction of their works, which will be on a moderate scale at first, but which the firm expect will ultimately attain very considerable dimensions. Captain Cunningham and his son are to be the chief engineers. The metallic sodium produced by the syndicate at Hebburn is to be sent to Wallsend, where it will be used by the Alliance Aluminium Company—who have made arrangements for erecting large works there—in the manufacture of the metal aluminium on a very large scale. The object of the Alkaline Reduction Syndicate at Hebburn, and the Alliance Company at Wallsend, is, to produce aluminium by the new and extremely cheap process. In the production of sodium, the syndicate has, so far, conducted its work in an experimental manner, and the experiments are now to be put to a practical test by erecting works on a manufacturing scale. If the test is successful, then large works will be built at Hebburn for the production of sodium to be supplied to the Aluminium Company at Wallsend. The Hebburn syndicate and the Wallsend Company are separate and distinct firms, but each is composed of well-known and influential capitalists.

Hengst Powder.—Hengst's powder is manufactured from straw properly prepared and chemically treated, and finally converted into a gunpowder of granular form. Its special use lies in the direction of military and sporting purposes, although in its compressed form it will probably be found applicable to blasting operations, inasmuch as, weight for weight, it possesses about 150 per cent greater strength than gunpowder, and it appears to be impossible to explode it by concussion. Its action, however, is more rapid and local than that of gunpowder, so that a greatly reduced charge only is required to produce results equal to those produced by that explosive. But, notwithstanding the rapidity of its action, so far as present investigation has gone, it would appear to be peculiarly suitable for the two main purposes which Mr. Hengst had in view when inventing it, namely, military and sporting. In order to test the merits of the powder, a series of trials was recently carried out by Mr. Perry F. Nursey, C.E. at the testing ranges of Messrs. Cogswell & Harrison, at Harrow. The experiments were made comparative with black powder, and in the trials having reference to military use the government pattern Martini-Henry rifle and ammunition were used. The charge in the case of the black powder was 85 grains, as against 35 grains of Hengst's powder, all other details remaining the same. Considering that the latter powder was only produced experimentally and in small quantities, the results were very satisfactory. The velocities, which were taken by chronograph, appear to have been a little lower and a little less uniform than those of the black powder. As regards smokelessness, flamelessness, non-heating, and non-fouling with the Hengst powder, these points appear, says *Iron*, to have been set at rest by Mr. Nursey's experiments. Smoke there was none, says that gentleman's report; only a puff of light vapor (carbonic gas), which rapidly condensed and disappeared from sight. Flame there was none, so far as the eye could detect in a darkened rifle range, only a faint pale blue glow being visible at each discharge. Fouling there was none, in the ordinary sense of the word, while a number of rounds fired in rapid succession failed to do more than warm the barrel. An equal number of rounds of black powder similarly fired from the same rifle, cold, heated it considerably. As regards the nature of the report, it appears that in every case there was distinctly less noise with the Hengst than with the black powder.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

Light Locomotives. By H. K. Porter & Co., Pittsburg, Pa. 1889. Sixth Edition.

"Kellograph," the American Mining and Stock Code. By A. W. Kellogg, M.E. Published by Kellogg, Whitaker & Co., Denver, Colo. 1888. Pages, 592. Price, $5.

The Mercantile Year Book and Directory of Exporters in London, Manchester, Liverpool, Birmingham, Glasgow and Bristol. Edited by Walter Lindley Jones. Published by Lindley Jones & Co., London, Eng. 1889. Second Edition. Pages, 296. Price, six shillings.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED APRIL 23, 1889.

401,744. Secondary Battery. William W. Griscom, Haverford College, Pa., Assignor to the Electrical Accumulator Company, of New York.
401,751. Water Wheel. Frederick Le Bean, Buffalo, N. Y.
401,756. Motor Car Truck. William H. Patten, Pueblo, Colo.
401,761. Combined Motor and Electric Generator. Jabea F. Shawhan, Dayton, Ohio, Assignor of one-half to James W. Carpenter, same place.
401,779. Wire Belting for Machinery. William D. Edge, Newark, N. J.
401,782. Surveyor's Corner Stake. John H. Howlett, Washington, D. C.
401,784. Straight-Way Valve. Warren T. Kellogg, Lansingburg, N. Y.
401,796. Electric Railway System. Sidney H. Short, Columbus, O.
401,797. System of Elevated Conductors for Electric Railways. Sidney H. Short Columbus, O.
401,803. Electric Meter. Elihu Thomson, Lynn, Mass.
401,804. Metallic Car Wheel Mold. Nathan Washburn, Boston, Mass.
401,816. Rotary Engine. Marcellus A Buford, Thompson's Station, Tenn.
401,828. Process of Preparing Sulphate of Silver. Frederick Gutzkow, San Francisco, Cal.
401,831. Cut-Off Valve Gear. Andrew L. Harrison, Wilmington, N. C.
401,835. Rotary Engine. John F. Hines, Sr., San Antonio, Tex.
401,841. Hoisting Machine. Timothy W. Lemieux, Duluth, Minn.
401,853. Valve for Steam Engines. W. S. Phelps, St. Catalina, Guantanamo, Cuba.
401,855. Motor for Street Railways. Benjamin C. Pole, Camden, N. J.
401,862. Machine for Pulverizing Clay and Extracting Stone. John W. Shaffer, Philadelphia, Pa.
401,870. Truss for Buildings or Bridges. John T. Wells, Scottsville, N. Y.
401,896. Hydraulic Dredging Machine. John McFarlane, Washington, D. C., Assignor, by direct and mesne assignments, of part to George J. Bessler and Henry Wex, same place.
401,903. Process of Manufacturing Iron and Steel. Jacob Reese, Pittsburg, Assignor to the Bessemer Steel Company, Limited, Philadelphia, Pa.
401,915. Automatic Pump Governor for Brake Mechanisms. George Westinghouse, Jr., Pittsburg, Pa.
401,916. Engineer's Brake Valve. George Westinghouse, Jr., and Frank Moore, Pittsburg, Pa.
401,924. Valve for Steam Engines, Gustav A. Barth, St. Louis, Mo., Assignor to Pierre Chouteau, same place.
401,929. Power Meter. Frank M. Clark, Tilton, N. H., and F. R. Low, Chelsea, Mass.
401,949. Metallic Railroad Tie. Arthur J. Hartford, New York, N. Y., Assignor by direct and mesne assignments, to the A. J. Hartford Steel Railway Tie Manufacturing Company, of West Virginia.
401,964. Ore-Grinding Mill. Joseph McKenzie, El Dorado, Cal., Assignor to De Witt C. Morgan, same place.
401,984. Rod Packing. Sivert Udstad, Aurora, Ill.
401,996. Coupling for Pipes or Tubes. George W. H. Brogden, London, Eng.
402,009. Bearing for Journals. William E. Elliott, Chicago, Ill.
402,014. Clutch. Louis Goddu, Winchester, Assignor to J. W. Brooks, principal trustee, Cambridge, and F. F. Stanley, associate trustee, Swampscott, Mass.
402,015. Hydraulic Governor for Engines. William H. Gray and James D. Gray, West Falls, Md., Assignors to the Gray Automatic Steam Governor Co., of Alexandria, Va.
402,029. Former for Pipe-Molding Apparatus. Andrew H. McNeal and William A. Stineruck, Burlington, N. J.
402,070. Safety Valve. William F. Cunningham, Brooklyn, N. Y., Assignor of one half to Enoch Rutzler, same place.
402,080. Electric Car. John W. Henderson, Philadelphia, Pa.
402,084. Incline Electric Railway. Rudolph M. Hunter, Philadelphia, Pa.
402,086. Engine. Julius Jonson, New York, N. Y., Assignor of one half to Julius Elsen, same place.
402,094. Ore Concentrator. William H. Meginnes, Denver, Colo.
402,100. Valve Gear for Duplex Steam Pumps. Bathan E. Nash, Stonington, Conn.
402,101. Machine for Making Axles. Andrew Paterson, McKeesport, Pa., Assignor to the National Tube Works Company, Boston, Mass.
402,102. Method of Making Axles. Andrew Paterson, McKeesport, Pa. Assignor to the National Tube Works Company, Boston, Mass.
402,103. Flux Feeder for Blast Furnaces. Nathaniel A. Pratt, Atlanta, Ga., Assignor to the Pratt Steel Company, Birmingham, Ala.
402,107 and 402,108. Process of Welding Together Sections of Pipe by Electricity. Elias E. Ries, Baltimore, Md., Assignor to Ries & Henderson.

PERSONAL.

Mr. L. L. Nunn has been appointed general manager of the Keystone Placer Company, of San Miguel, County, Colo.

Mr. John Tregoning, Superintendent of the Thomson-Houston Electric Welding Company, will shortly sail for Europe.

Mr. F. M. Taylor, of Taylor & Brumton, Mining Engineers, who has been in New York for some time, has gone to Colorado.

Mr. J. B. Wheeler, President of the Aspen Mining and Smelting Company, has gone to Colorado. He is expected back next Tuesday.

Mr. James D. Hague, Mining Engineer, and President of the North Star Gold Mining Company, of Grass Valley, Cal., has returned from California.

Mr. J. B. Dayton, who was Superintendent of the Prussian mine at Jefferson, Nye County, Nev., from 1873 to 1876, died in Oakland, Cal., on the 1st inst.

Mr. William Hezekiah Parmelee died last week in Lockport, N. Y., aged 28 years. He has been associated with his father in the coal trade, and held high rank as an active, honorable, and successful business man.

Through an oversight we neglected in our last issue to credit the *American Manufacturer*, of Pittsburg, with the interesting and valuable description of the McSweeny puddling furnace for using natural gas, and for the plates which illustrated it.

Mr. S. Wollberg, the well-known mining share broker (of New York), sails for Europe on May 8th. On his return he will proceed to San Francisco, where he has a large interest in the stock brokerage firm of Zadig Wollberg & Co. His representative in New York will be Mr. Samuel White, Jr.

AT LAST!—The Ontonagon *Miner* says editorially that a rumor comes from Boston that there is to be a reorganization of the Calumet officers, with a view of reducing the large working expenses at the lake end of the line. In view of this move some of the leading officials have sent in their resignation. The recognition of the accuracy of the ENGINEERING AND MINING JOURNAL'S criticisms of Calumet & Hecla management has been deferred at the expense of the stockholders, but now at last our efforts to promote their interests would seem to be about to bring forth fruit.

Mr. Gardner H. Sheldon died on the 8th inst., at the age of thirty-two years, at Corralitos, State of Chihuahua, Mexico. At the time of his death he was assistant general manager of the Corralitos Company. He had been connected with the company for eight years, and risen from assistant superintendent of mines through several grades to the above position. He graduated from the School of Mines, Columbia College, in 1879, and immediately thereafter went West, and was up to his death actively engaged in his profession. In him the profession loses a young man of great promise.

The Iron and Steel Manufacturers' Association, which heretofore met each year with a committee of the Amalgamated Association and settled the wage scale, is no longer the powerful organization it once was. Mr. Joseph D. Weeks, who is the secretary of the association, says that the organization has practically dissolved. A. F. Keating was president Last year he declared he would have nothing more to do with the concern, and has kept his word. Other manufacturers have also held aloof, and no meetings have been held. The manufacturers' cause at the convention in June will not be made much weaker by this state of affairs, because it is down now about as low as it can get.

The National Convention of Machinery Constructors, Knights of Labor, were in secret session in Detroit, Mich., this week. Delegates from all sections of the country were present. The session is said to have been the cause of Powderly's visit to Detroit. "It has leaked out that this combination of Knights of Labor assemblies, the most influential in numbers in the United States, have instructed their delegates to take steps to secede from the Knights of Labor and resolve themselves into trades unions, and have representation in the Federation of Trades. Their movement is based upon the claim that the general management of the Knights of Labor serves them in no good stead in their relations with their trades; that it is an organization which deals with abstract principles, while their immediate interests are of more importance, and that thes interests will be better subserved in the trades union."

The following are the committees appointed at the meeting of the Boiler Manufacturers, held at Pittsburg, Pa., and to which we referred in our last issue:

Committee on Materials and Tests: E. D. Meier, St. Louis; Richard Hammond, Buffalo; H. J. Hartley, Philadelphia; J. R. Brownell, Dayton, O.

Committee on Proper Rules for Riveting and Calking: Robt. M. Connery, Philadelphia; John MacCormack, Albany; J. Mathews, South Bend, Ind.

Committee on Manheads and Manholes: Jos. F. Wangler, St. Louis; A. Wilfong, Philadelphia; J. S. Shanks, Salem, O.; Luther Allen, Cleveland, O.; R. Munroe, Pittsburgh, Pa.

Committee on Bracing and Stays and Proper Tube Spacing: J. C. McNeil, Akron, Ohio; J. P. Jefferson, Warren, Pa.; Henry Warden, Philadelphia.

Committee on Attachment of Valves and Fittings: Richard Garstang, St. Louis; Thomas S. Driscoll, Columbus, Ohio; George S. Barnum, New Haven, Conn.

Committee on Safety Valves and Horse-power: H. R. Barnhurst, Erie, Pa.; Charles F. Foster, St. Louis, Mo.; J. W. Wood, Phillipsburg, N. J.; John Trefts, Buffalo, N. Y.

Committee on Uniformity in State Inspection Laws: George Marshall, Dayton, Ohio; Thomas G. Lovegrove, Philadelphia, Pa.; Christopher Cunningham, Brooklyn, N. Y.; G. N. Barnes, Corry, Pa.; Philip Roban, St. Louis, Mo.

INDUSTRIAL NOTES.

The Falling Spring Furnace, at Chambersburg, Pa., which has been idle for five years, will, it is reported, be put in operation about July 1st.

It is reported that the present owners of the Shelby Iron Company, the producers of the well-known charcoal iron, at Shelby, Ala., are willing to sell their interest in that property.

The mills of the San Diego Iron Works at Roseville, Cal., have turned out their first product in the shape of galvanized-iron wire cloth. The wire and nail departments will be opened soon.

The British steamship "Cordonilla," Capt. Gavin, has arrived in Baltimore with 1750 tons of manganese iron ore from Macri, Turkey, the first of that article brought to that city from that port. It is for the Edgar Thomson Iron Works in Pennsylvania.

Only a few heats were made on the Bildt process by the Troy Steel and Iron Company, Troy, N. Y., to which we referred in our last issue, nor was the steel produced carried as low as it is possible to go, the carbon contents of the steel ranging between 0·06 and 0·09 per cent.

The Edison General Electric Company has been organized, with a capital stock of $12,000,000. The new company is formed by Henry Villard and Thomas A. Edison, and associates, to carry out the recently perfected arrangements for consolidating the Edison Electric Light and Manufacturing Companies.

Gordon, Strobel & Laureau Company, Limited, of Philadelphia, Pa., has just closed a contract with the Belmont Nail Company, of Wheeling, W. Va., for a third 19 by 55 Gordon Whitwell Cooper fire-brick stove. This furnace originally had two of these stoves, but wishing to increase their production they have added this third stove.

The Thomson-Houston Company nine months ago had in operation one motor. It has now 104 motor cars in operation on eighteen roads, with 85 miles of track. And it has now under contract the building of 147 motor cars for 23 companies, with 42 more miles of road. This is certainly very rapid development.

The Braddock Wire Mill Company, Braddock, Pa., has broken ground for a large blast furnace and converting mill immediately adjoining its present works at Rankin Station, and the company will hereafter make its own steel and pig metal. The steel that cannot be used at the Braddock mill, at the completion of the extensions, will be shipped to the wire mill in Illinois.

The Joliet Steel Company, of Joliet, Ill., has been in negotiations with the Amalgamated Association of Iron and Steel Workers, and made the following settlement, which provides that the price of rail steel for the year 1889 shall be 10 per cent less than the price paid in 1888, and for soft steel, which the mill will be chiefly engaged upon for the year there shall be an advance of 5 per cent over the wages paid last year, or 15 over this year's rates. The other minor matters of settlement are the same as last year's agreement. The mills will resume operation on May 6th.

The Michigan Stove Company, of Detroit, Mich., whose superintendent, Mr. W. J. Keep, made last year some extremely valuable experiments on the influence of aluminum in iron castings, described and illustrated in the ENGINEERING AND MINING JOURNAL, August 18, 1888, is devoting much attention to the promotion of the use of aluminum in various forms, and is now selling the metal as manufactured in Pittsburg, from 90 to 98 per cent pure. It is said that the difficulties experienced in rolling the metal have been overcome.

A mortgage for £550,000 has been filed in the Hudson County (N. J.) Register's office on the property of the Hudson River Tunnel Company. The Farmers' Loan and Trust Company, Reginald Algernon Capel, of No. 21 Chesham Place, Belgrave Square, in County of Middlesex, England; Lord Claude John Hamilton, of No. 23 Lowndes Square; Alexander Hubbard, of Derwentwater House, Acton; Henry Brougham Kendale, of "The Hyde," Hatfield, Herts, make the loan which it is said will enable the Tunnel Company to begin work again.

The Stoney Creek Iron Mill at Norristown, Pa., which for the past few years has been running spasmodically, and has been idle since early last fall, resumed operations on the 23d inst. in every department. This event has been brought about by a proposition advanced to the Stoney Creek Iron Company by many of its old and most trusted employés, and accepted by the company. An agreement growing out of the proposition has been signed by the firm and most of the men. Under this agreement a scale of wages has been adopted, based on the selling price of iron. The men are to be informed as to what the company receives for its product, and for every increase of $2 per ton in the selling price the men are to receive a proportional increase in wages.

The Dixon Crucible Company, of Jersey City, N. J. prepares a graphite lubricant for wire ropes. The graphite must be pure and only the flake is useful. It is prepared in a grease which makes the application of the graphite to the wire rope easy. A tin tube is made trumpet shaped, the small end just large enough to fit the circle of the rope, the other end large enough to carry two or three pounds of the graphite grease. The rope traveling through this tube will coat itself—one coating in two weeks is enough—and this practice alone will double the length of life of the rope. The graphite prevents the wire from rusting—it saves the rope from abrasion when striking hard substances; it also prevents the wires forming the rope from abrasion one against the other, as the graphite finds it way into and fills the minutest spaces, and is held there by the fatty substances in the mixture. The facts above are furnished from his own experience by one of the leading mining engineers of the country.

The Secretary of the Treasury recently received a letter of inquiry whether the transfer by manufacturers from any foreign country to the United States of their plant of machinery, work people and interests or any portion thereof with a view to permanent settlement would in any way conflict with laws relating to alien contract labor, and also whether such of their machinery as had been in use would be entitled to free entry. In response the Secretary called attention to the provisions of section 1 of the act approved February 26th, 1885, which provides that it shall be unlawful for any person, company, partnership, or corporation, in any way whatsoever, to pay transportation or in any way assist or encourage transportation or migration of any alien or aliens, any foreigner or foreigners into the United States under contract or agreement, parole or special, express or implied, made previous to the importation or migration of such alien or aliens, foreigner or foreigners, to perform labor or service of any kind in the United States The secretary said that as no facts are stated which would exempt the importation of "work people" referred to from the provisions it would seem that their transfer in the manner proposed would be in violation of the law. In answer to the inquiry as to the entry of machinery referred to, the secretary said that there is no law under which such free entry can be authorized.

CONTRACTING NOTES.

Our list of machinery and supplies wanted will be found on page xii. Manufacturers of machinery, engineers and contractors should also consult our directory of "Contracts Open" on the same page. This week, proposals are invited for the following new contracts: No. 1373, Water-Works Construction; No. 1374, Building Iron Bridge; No. 1375, Water-Works System; No. 1376, Furnishing Belgian Paving Blocks; No. 1377, Dredging; No. 1378, Embankment; No. 1379, Furnishing Iron Moorings; No. 1380, Sewer and Street Work; No. 1381, Construction of Pumping Station and Reservoirs; No. 1382, Furnishing Stone; No. 1383, Completion of Sewer; No. 1384, Grading and Masonry for Railroad.

The Standard Oil Company has contracted with the Riverside Iron-Works, of Wheeling, W. Va., for 25 miles of steel pipe for one of its pipe lines near Warren, Pa.

The bids for the construction of the Wytheville Water-Works, Wytheville, Va., were as follows: H. J. Curtin & Co., Scheme A, $22,900; Scheme B, $19,817. Kirk & Reynolds, Chattanooga, Scheme A, $27,450; Scheme B, $24,825. H. B. Maupin, Scheme A, $22,595; Scheme B, $19,645. Glamorgan Company, Lynchburg, Scheme A, $19,925; Scheme B, $17,975. Porter, Jackson & Co., Chicago, partial bidders, not considered. The committee recommended adoption of Scheme B of the Glamorgan Company.

GENERAL MINING NEWS.

ALASKA.

ALASKA GOLD MINING COMPANY.—The Risdon Iron works of San Francisco has been awarded a contract by this company to build a 120-stamp mill, to be run by steam power and to be equipped with all the latest improvements.

ARIZONA.

PIMA COUNTY.

PEERLESS MINING COMPANY.—During the week ended the 21st inst., the company shipped five bars of bullion valued at $10,800.

CALIFORNIA.

AMADOR COUNTY.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—This company has just issued the following report for the first quarter of 1889: Indebtedness, January 1st, 1889, $15,416.93; January expenses, $4,651.03; February expenses, $5,839.56; March expenses, $7,760.66; total, $33,698.18; clear up of bullion for March, $27,357.44; indebtedness, $6,340.74. Forty stamps are running. Work is being pushed as fast as consistent with safety. The Superintendent hopes to have the old part of the mine opened by May 10th. At present rock is being hoisted from the fifteen and sixteen hundred-foot levels.

MONO COUNTY.

BULWER MINING COMPANY.—At the annual meeting the following officers were elected: Monroe Thompson, President; Chas. H. Fish, Vice-President; L. Osborn was re-elected Secretary and John Kelly Superin-

tendent. The secretary's statement showed an indebtedness of $2,304.83.

COLORADO.

ARAPAHOE COUNTY.

BOSTON & COLORADO SMELTING COMPANY.—At the annual meeting in May the stockholders will propably be asked to vote upon a proposition to increase the capital stock $250,000, or to $1,250,000.

CHAFFEE COUNTY.

JOSEPHINE.—This mine, in the Bonanza District, has about ceased operations. It was shut down because of a lack of funds to prosecute the work further. Mr. Quimby has retired from the management of the Josephine.

CLEAR CREEK COUNTY.

LAMARTINE.—We learn from Mr. F. E. Himrod, the owner of this mine, that the work of sinking a new shaft 175 feet east of the old one has been commenced. This shaft will be 9 × 5 feet, and it is proposed to sink it to a depth of 500 feet. About thirty-five men are steadily employed and shipments of ore are being made regularly, the last being one of 60 tons on April 6th. Mr. Himrod contemplates extensive improvements, which, he believes, will require the outlay of $15,000 within the next eighteen months; at least, this is the amount he proposes to spend. He has been considering the various applications of electricity in mining, as chronicled in the ENGINEERING AND MINING JOURNAL, and if he can use this agent successfully and economically it will probably be given a fair trial.

EAGLE COUNTY.

[From our Special Correspondent.]

RED CLIFF, April 6.

The recent strike in this district occurred on Battle Mountain, and but a few hundred yards from the town. It still continues undiminished in size and its claim to permanency is an almost assured fact. The strike embraces an ore body some 8 feet wide, and in the face of an open cut it attains a height of 8 feet, while the downward trend at a sharp angle continues. Some very high grade assays have been taken indiscriminately from the ore body, showing results of 200, 300 and 400 ounce ore. This body occupies an entirely new contact in the limestone, cropping out between the dolomite and strata of flint, or more properly a quartz-porphyry. This contact is below the old blue limestone, or carboniferous contact, which has generally been accepted as the great ore-bearing rock in Colorado, hence the great majority of the developments on Battle mountain have been confined to that stratum. It is not at all unlikely that the ore has leached from the upper or original contact, into the lower one and finally at a considerable depth finds its bottom on the top of the parting quartzite. In order to believe this one has but to enter the incline in the blue limestone and see where continuous stringers of a very high grade mineral occasionally forming pockets) turn sharply and penetrate the floor, all pitching downward, in many cases very near a perpendicularly into the underlying dolomite. The Horn-Silver, Eighty-four, First National, and others exhibit these faults in a marked degree. The writer, very near a year ago, visited the Horn-Silver and found the lessees sinking a winze by the side of an intrusive porphyry pillar, carrying a stringer of ore downward into the dolomite. In a few cases this fact seems to be fully accepted, for several parties have leased properties covering both contacts, and are sinking on ore to the dolomite contact. It is not at all improbable that Battle Mountain's great limestone ore deposits are faulted like those of Aspen, and that the coming immense bodies will be found lower than formerly supposed. At any rate the new discoveries have given a marked stimulus to prospecting and further development in this section. It may be well to mention that the new strike occurs in the Henrietta property, owned by Messrs. Gay, Latem & Bowland, all of Red Cliff.

The suit between the Battle Mountain and Champion claims comes off at Denver next month, affecting the rights of the quartzite and lime properties. In my next I will speak of the camps generally.

GILPIN COUNTY.

CALIFORNIA MINE COMPANY, LIMITED,—A gold retort weighing 439 ounces is the product of a three weeks' run of 30 stamps of this California mill on ore from the California mine, on Quartz hill. The full capacity of the mill—75 stamps—is kept in motion, 45 stamps being employed on custom ore.

GREGORY-BOBTAIL MINING COMPANY.—This company is running 100 of its 125 stamps. In the incline shaft, no work is being done in the heading, the ore taken out coming from a depth of 615 feet west.

LAKE COUNTY.

At a meeting of the Board of Trade at Leadville, on the 18th, the Deep Shaft Committee to which we referred in our issue of March 23d, recommended the immediate organization of a company with a capitalization of $600,000, shares of $1 each, allowing 15 lots to the acre on a basis of 1000 acres. After deducting the 75 per cent of the stock to be paid for the sinking of the shafts this will enable the company to pay 10 shares for the mineral rights to each lot, and 150 shares for the mineral rights of each acre. The committee recommended that Messrs. A. Sherwin, M. Londoner and Amos Henderson be requested by the board to act as incorporators of the company and as directors of the same for the first year of its existence. The committee recommended that immediate steps be taken for organization of the company.

EVENING STAR MINING COMPANY.—The recent dividend of $12,500 is numbered 58, and is the second since November, 1885; the first having been declared November, 1888. This makes a total of $1,425,000 paid by the Evening Star since it became a producer. Shipments of argentiferous iron, says the Leadville *Dispatch*, have averaged 50 tons a day for the past six months, the average value of which was about 10 ounces in silver and 45 per cent excess in iron. The principal part of this product has been from the main and upper shafts. Mr. Eben Smith's lease on the east end of the Evening Star has been producing good carbonate ore from the second contact, adjoining the Castle View.

LEADVILLE CONSOLIDATED MINING COMPANY.—The gross product for March, the JOURNAL is informed, was $7,114.61, of which the lessees received $4,900.97.

SMALL HOPES CONSOLIDATED MINING COMPANY.—Secretary C. A. Cameron informs the ENGINEERING AND MINING JOURNAL that the dividend fund on the 1st inst. amounted to $17,478.53 and the reserve fund $54,095.77. The gross product for March was $11,313.43. The dividend fund would have been much larger had it not been for the tax which the Colorado legislature levied upon the output of the mines of the State, and which in the case of the Small Hopes amounted to nearly $10,000.

WARD CONSOLIDATED MINING COMPANY.—The announcement of a $10,000 dividend by this company last week calls attention to the fact that the deposits of Fryer Hill, Leadville, are by no means exhausted yet. This company was organized in 1881. It has a capital stock of $2,000,000, divided into 200,000 shares. Those interested, we understand, are principally Eastern men. W. D. Dominick, of Dominick & Dickerman, the stock brokers, is secretary. The assistant secretary is J Edwards, who occupies a similar position with the Morning Star, Evening Star and Ouray Union mining companies. Active work upon the property has only been done within the past year and a half. The principal mines owned are the Olive Branch and the El Paso. Mr. Dominick said this week that the company has now a surplus of $50,000, which the directors will endeavor to preserve intact.

WHITE HOUSE CONSOLIDATED MINING COMPANY.—The President and Quintette Mines have been consolidated and will be worked by this company which owns the White House, M. A. P., Amity, Blue Bird, President and Quintette claims. St. Louis capitalists are interested in the enterprise and it is stated that work will be resumed on the properties in the near future with abundant capital to work them in first-class shape. The new company, it is said, will have a board in St. Louis. The President is located in Temple Gulch, St. Kevin district, and has already been a producer. There is a mill on the property, but it has been shut down for some time on account of the almost impassable condition of the road between the mine and the mill.

PITKIN COUNTY.

[From our Special Correspondent.]

The local papers have described the bonanza mines within an area of three miles, the Park-Regent to the north of Aspen, the Celeste and Edison to the south. Some 2,000 unexplored mineral locations, as shown by Mr. E. L. Ogden's new map, are subject to development, lease and bond at royalties from 15 to 35 per cent, bond $10,000 to $50,000, according to location. Approximate cost of sinking 4 by 8 feet cut timber shaft 200 feet through wash, débris and soft shale, $9 per foot; brown or broken lime, $9 to $12 per foot; blue lime, $6 to $12; very siliceous blue lime, $18 to $35; average miners' wages, $3 to $3.50 per eight-hour shift. Engineers, $5 per twelve-hour and $4 for eight-hour shift. Hoisting engines rent at $50 to $125 per month, according to power. Pumps and machinery prices same as at Leadville. The ore chutes are found at 118 feet from the surface, as shown in the Mineral Farm 3000 feet north of the Park-Regent, and the 3000 feet North Aspen, Town site 882. The Franklin shaft is 882 feet deep. Level No. 3 of the Veteran tunnel connects with the pumping station in the Franklin shaft. These figures give the minimum and maximum amount of development required for shaft sinking.

At Mineral Farm Shaft No. 3, at a depth of 118 feet, 2 feet of 50-ounce ore was reached. J. B. Grant *et al.* have lease and bond.

EDISON.—This mine has been leased from December 27th, 1888, to September 22d, 1889. There are 800 feet of development in ore. Average smelter returns for month of March, 55 ounces of silver. Payroll, $7398.

FARWELL.—These gold mines are situated in Independence, Colo. The leasers, Messrs. Brown, Bolles & Williams, will add 30 stamps to the mill, making a total of 50 stamps. Concentrates, running 6 to 7 ounces gold per ton, are being shipped to the Rust Sampling Works at Aspen, Colo.

MOLLIE GIBSON.—The mineral found in the north and south levels from Cross-cut No. 5, 60 feet from the surface, gives mill returns of 4800 ounces for first-class ore, 1710 for second-class, and 69 ounces for third-class ore. A shaft-house 36 × 80 feet is built, Jackson double-geared engine and hoister, boiler pump, Rand air compressor and drills are set up. The shaft will be sunk 150 feet, for starting a second level.

SAN JUAN COUNTY.

SUNNYSIDE EXTENSION.—The mill to be erected this spring will be fitted with four batteries of five stamps each, giving a capacity of 45 tons per day. Only the ore running less than five ounces gold will be treated by it, the balance of the product going to the Pueblo and Denver markets. There are at least 2,000 tons of milling ore in the dump, all of which will be run through before drawing on the mine for supply.

SAN MIGUEL COUNTY.

Operations will be resumed at the Fall Creek placers shortly, money for working the same, it is said, having been obtained in New York City. Mr. L. L. Nunn will have general management of this property and a thorough test will be made.

GOLD QUEEN MINING AND MILLING COMPANY.—This company, which owns the Tryangle, Golden Eagle and Gold Queen, all of which are said to be on a direct line with the extension of the Gold King, on the southern slope of Silver Mountain, in Iron Springs district, did considerable development work last year, and several test runs were made, the result of which was so satisfactory that the Goble & Lane mill at Ophir has been leased by them for this year. During the season a 25-stamp mill will be built and preparations made for extensive work next year.

KEYSTONE PLACER COMPANY.—The work on this property will be begun immediately. Mr. L. L. Nunn is also manager of this property.

UTAH COUNTY.

NORTH AMERICAN ASPHALT COMPANY.—It is understood that a company will soon be organized to handle the products of this company's mines in this Territory. The movers in the enterprise are well known business men in Salt Lake City, Ogden and Provo. They will receive the prepared asphalt on the cars at Thistle, and contract for paving sidewalks, etc., with the material. It is probable that Pickett's patent tramway will be used to convey the material from the mine to the mill, and as soon as this or some other system is adopted, active operations will be commenced.

DAKOTA.

LAWRENCE COUNTY.

DEADWOOD CONSOLIDATED MINING AND MILLING COMPANY.—The directors of the Deadwood Reduction Works and the officers of the Golden Reward have engaged Mr. Thomas H. White, Mining Engineer of Deadwood, to visit the Golden Reward property and make a report of the condition and workings of the property. In our last issue we referred to the consolidation of the two companies.

IDAHO.

ALTURAS COUNTY.

ALTURAS GOLD, LIMITED.—The liquidators of this company give notice that all subscribers of the Elmore Gold Company, Limited, are entitled to tender for the surplus shares of the Elmore Gold Company, Limited, now in the hands of the said liquidators. Forms and conditions of tender may be obtained on application at the offices of the company, 20 King's Arms-yard, London, E. C.

INDIANA.

MARION COUNTY.

BROAD RIPPLE NATURAL GAS COMPANY.—On the complaint of one of its directors, Omar A. Boardman, the man who was foremost in this company, Mr. Charles Scholl, the bookkeeper of the company, was appointed Receiver. Its supply of gas is taken from the small wells in the northern part of this county, and its consumers have been necessarily limited. The plant cost about $150,000, and the receipts have not been sufficient to extend the supply of mains. The indebtedness is $117,000, of which $12,000 is a first mortgage debt. The rest is unsecured.

MICHIGAN.

COPPER MINES.

NATIONAL COPPER MINING COMPANY.—The stamp mill is doing excellent duty, breaking 150 tons of very hard rock every twenty-four hours, which is yielding a fair percentage of copper. Underground the mine is reported as looking well. There is sufficient ground opened up to keep the mill running for a long time, it is said, without sinking or drifting another foot.

QUINCY MINING COMPANY.—The Supreme Court at Houghton has set aside Judge Williams' decision dismissing the Quincy petition for right of way through Pewabic property. The case will come up next month.

IRON MINES.

ANVIL.—At this mine a new body of ore has been discovered just west of No. 1 shaft, which has been pronounced the largest deposit that has ever been found on the property. The total output of this year is estimated at 75,000 tons and 15,000 tons have already been sold for deliuery this season.

MONTANA.

DEER LODGE COUNTY.

GRANITE MOUNTAIN MINING COMPANY.—A strike has been made in tunnel No. 9 east 12 inches wide that assayed, it is reported, 160 ounces. On the hanging-wall there were four inches that assayed 99 ounces. This strike is in the lowest workings of the mine.

WEST GRANITE MOUNTAIN MINING COMPANY.—The stockholders who are not in favor of the scheme proposed by the syndicate referred to in our issue of March 30th have been requested by a circular signed by G. S. Gardner, P. O. box 648, St. Louis, to send their names to the above, who will notify them of the time and place when and where a meeting will be held to discuss the matter and take such action as may be deemed necessary. The scheme set forth in the circular is to organize a new company by the stockholders, who are to have the privilege of exchanging their present stock for stock in the new company at the rate of two shares of old stock for one of new. In addition, they are to have the privilege of buying an equal number of shares of the new stock at 60 cents a share (which is equivalent to 30 cents a share for the present stock). This would bring into the treasury $150,000, provided all the old stockholders availed themselves of the opportunity of buying a number of shares equal to the number gotten in exchange for old stock. Those who did not elect to purchase new stock could leave it in the treasury, and it

could either be sold at once to other stockholders or be retained in the treasury as treasury stock. If one half of the old stockholders decided to take as much of the new stock as they would be entitled to buy, it would place in the treasury $75,000, which would pay the present indebtedness of $50,000 and leave $25,000 as a working capital, and there would still remain in the treasury 125,000 of the new stock, which, at present prices, would yield a large amount in excess of what the syndicate proposes to pay for it. This is the plan formulated by the stockholders in St. Louis, who are outside of the syndicate, and who have objected to those gentlemen who are willing to advance $150,000, thereby securing a controlling interest in the Elizabeth company at 30 cents. It is doubtful if the new scheme, of which one G. S. Gardner appears to be the originator, will effect any change in the plan gotten up by the West Granite directors.

LEWIS & CLAKE COUNTY.

MAJOR BUDD GOLD AND SILVER MINING COMPANY.—Judge Dewolfe, of the Second District Court at Butte, on the 20th inst. heard argument in the injunction proceedings instituted by B. J. Fine et al., stockholders in the Major Budd Mining Company, vs. Schwab & Zimmerman, of Helena, and has dismissed the injunction on the ground of lack of jurisdiction. In our issue of the 6th inst., we reported that the defendants in the present suit obtained judgment by confession made by the officers of the company, secured by a note given by them for $32,000, and upon such confession an order of sale of the property was issued by the District Court. Before the day of sale appointed by the court arrived Fine obtained a temporary restraining order inhibiting the Sheriff from making the sale. Hearing of argument why the temporary injunction should not be made permanent was set for the 20th inst., the date upon which the temporary injunction expires. This action relegates the case back to the First District, from which execution was served, and another twenty days' notice must be served before the property can be sold. The Fine faction will now bring suit in the First District to set aside the confessed judgment, such action being contemplated before Judge Dewolfe's decision.

SILVER BOW COUNTY.

ALICE GOLD AND SILVER MINING COMPANY.—Advices received at the New York office of the company this week stated that a "strike" has been made in opening up what is known as the Valdemere ground. This claim has not been exploited before.

NEVADA.

GARFIELD COMPANY, LIMITED.—The production in March amounted to $6600; revenue expenses, $8500; capital and development expenditure, $1300; tons crushed, 303. Five stamps working twenty-six days, working low-grade ore. An increase in production is anticipated this month.

[From our Special Correspondent.]

In passing through Nevada I have confined myself to points not far from the Central Pacific Railroad. There is certainly more stir going on this winter and spring in mining than for years past.

Arrangements are in progress to again work more extensively at Austin, and the prospect is fair. There is more going on at Tuscarora, about forty miles, northwest of Elcho, than anywhere else in the Eastern or central part of the State, and a good amount of rich ore is being raised, consisting of horn silver largely together with sulphides. The camp, like all others in Eastern and Central Nevada, labors under the disadvantage of no fuel or timber except as brought on the Central Pacific. So far as possible sagebrush is used for fuel. Coal on the railway costs from Wyoming $11 to $14 per ton or nearly the same price as at San Francisco, 600 miles further west. Coke from Colorado costs $16. Lumber brought east from the Sierra Nevada is $18 to $20. Of course, hauling prices must be added for 40 miles from Railway to Tuscarora and good round profits to middle men.

At Golconda an effort is making to open up a copper mine, a smelter lately having been erected at the mine, but the excessive drouth prevailing in all the great central valley from the Rocky Mountains to the Sierra Nevadas, has stopped the operation of the smelter. It will have to be moved 12 miles from the mine to the Humboldt River to permit its successful operation. The mine has a vein of carbonate of copper ore 56 feet thick, opened for 60 feet in depth and 200 feet in length, carrying 7¼ per cent, that will save in smelter without sorting, and some silver. Below the 60 feet, the ore is below the water level and becomes sulphuretted, richer in copper and silver, but more difficult of reduction. Economically operated with sufficient capital it should pay with copper at 10 cents per pound, notwithstanding the excessive prices of supplies caused by one railway, and that a monopoly.

At Reno there is one smelter, running chiefly on lead silver ores, and doing very well, and at reasonable prices.

Mining in Nevada has a heavy load to carry, as there is neither fuel nor timber to be had, except as brought in on the Central Pacific Railway, but brighter days are in prospect, as there are more railways in sight to occupy the territory, which will certainly reduce the charges, and they should be reduced. To-day freight for New York goes to San Francisco and the East, again past the point where it was first shipped from.

ESMERALDA COUNTY.

CONSOLIDATED ESMERALDA, LIMITED.—From a circular issued to the shareholders we learn that the mill was restarted on March 11th and has since been running steadily on ore extracted from the stopes opened up from the 375 foot (lowest) level (Durand Mine). The pay streak in the ledge has been narrow, but the ore has been good, and estimated to yield about 2 ounces gold per ton; within the last few days, however, a marked improvement has taken place. The superintendent states that the ore body is now 2½ feet thick, and the average assay value about 4 ounces gold per ton. From the discovery of the narrow seam of ore in drifting on the 375-foot level, reported March 20th, which assayed about 180 ounces gold per ton, it was expected that further developments would show an increase in the quantity of milling ore, and it is satisfactory to find that this has been the case.

NYE COUNTY.

BARCELONA MINING COMPANY.—We are officially advised by the New York representatives of this company that a new winze is down 20 feet from the tunnel level, and the superintendent writes that he has encountered a ledge of ore 3 feet wide. It is officially stated that during the past year $43,000 has been spent in improvements on this property, including the cost of the new mill.

STOREY COUNTY—COMSTOCK LODE.

Several improvements have been made to the Nevada mill, which will increase its capacity for working ore to 200 tons per day. Forty stamps are now crushing Hale & Norcross ore and 20 are at work on Chollar and Potosi ore. The mill is running very smoothly, with the joint power of the surface Felton wheel and three of the dynamos in operation on the Sutro tunnel level of the Chollar incline.

The San Francisco *Daily Report* says that it has good authority for saying that negotiations are pending between the Potosi, Bullion, Exchequer and Alpha Consolidated mining companies to resume work at the Ward shaft to prospect the eastern portion of the ground owned by these companies. The Sutro Tunnel cut through a large quartz body, carrying mineral, in front of these mines, which has never been explored on the south. The proposed arrangement is for the four companies to pay equally for the running of drifts on the levels from the 900 to the 1640, or Sutro Tunnel level, but the ground can be prospected down to the 2200 level of the Ward shaft without necessity for pumping, as the water has never risen above that point in the shaft. The extreme expense to the companies for doing this important exploratory work will be $2500 per month, and the cost of putting the machinery at the Ward shaft, and also the shaft itself in trim, will not exceed $1000. This combination will also facilitate the working of the Chollar and Potosi mines. It is intended to make a connection between the Ward shaft and the 930 level of the Potosi, which will give greatly desired ventilation to that mine and afford another outlet. It is also intended to connect the Sutro tunnel with the Ward shaft, which is equipped with some of the most powerful and costly machinery on the lode.

The Sierra Nevada and Scorpion mining companies have entered into an arrangement which will be of advantage to the shareholders. For a length of time the Sierra Nevada people have been working with little result west of their shaft, the Scorpion driving east in their ground with little better prospects. The latter company, owning a large expanse of unexplored territory running up to the Sierra Nevada line, will in the future co-operate with its neighbor, and open and develop this portion of the mine to better advantage and at less expense. The Sierra Nevada Company will first take up the work, and carry a drift through the eastern portion of the mine, which is still in a virgin condition, to the Scorpion line, where that company will take it up, the expense to be borne jointly. As the 520 level of Sierra Nevada has been chosen as the point of departure, the Scorpion will be tapped at a greater depth than any of the past workings. It is also possible that the Scorpion ground will be divided up into two or three other companies, the 4200½ feet covered by the location affording scope for others to come in and work to advantage and at less expense.

JUSTICE MINING COMPANY.—The mine continues to ship ore and produce bullion, and the company is said to be in good financial circumstances. A shipment of $2722 was advised on the 18th inst.

KEYES.—Mr. P. J. Keyes has attached this mine in Six Mile Cañon for $3725.17, alleged to be due him for salary as superintendent.

NORTH CAROLINA.

DAVIDSON COUNTY.

PIEDMONT REDUCTION COMPANY.—The United States Circuit Court for the western district of North Carolina has ordered the sale next month of the property of this company, which owns smelting works at Thomasville, and railroad and other property. The company was organized about three years ago to smelt the ores of the Silver Valley Mining Company and build a railway twelve miles in length to connect with the mines of the Silver Valley Company. The reduction company was declared insolvent in a suit brought by James Sluter, Morris Orem, T. C. Basshor and George Popplein, of Baltimore; and James Fletcher, also of Baltimore, was appointed trustee. The reduction company has spent $75,000 on its works and has an indebtedness of $35,000. A majority of the stock of both reduction and mining company is owned in Baltimore.

OHIO.

ALLEN COUNTY.

A large iron tank of the Standard Refinery, at Lima, exploded on the 20th inst., scattering 40,000 barrels of distilled oil in every direction. The loss is estimated at $40,000.

PENNSYLVANIA.

COAL.

A syndicate of capitalists, it is reported, has purchased considerable property in the Reynoldsville coal and coke district, in Jefferson County. Franklin B. Gowen is said to be interested in the purchase. The district is at present limited to transportation facilities to the Rochester & Pittsburg and the Allegheny Valley railroads. To develop the property, the syndicate is having a survey made for a new road to extend northward to Lake Erie at a point between Dunkirk and Erie, and to run eastward to the Delaware, Lackawanna & Western. There are already 1500 coke ovens at Punxsutawney, and the idea of the syndicate is not only to find a new Western and Eastern outlet for coke and coal, but to compete for the grain and general trade of the lakes.

LEHIGH & WILKES-BARRE COAL COMPANY.—This company being in funds, has called 168 of its sterling mortgage bonds for £200 each for redemption on May 1st.

SILVER BROOK.—The Philadelphia & Reading Railroad will hereafter carry the tonnage of this colliery, at Audenried, which has heretofore shipped its produce over the Lehigh Valley Road. The land where the breaker is situated has been about worked out, and efforts have been made for some time to secure a lease upon an adjoining valuable tract owned by the Catawissa Railroad, of which road the Reading is lessee. An arrangement was finally made for the lease of the land upon a royalty, coupled with the condition that the product should be shipped over the Reading Road.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to April 19th:

	1889. Gals.	1888. Gals.
From Boston	1,004,063	606,238
Philadelphia	37,679,570	33,281,073
Baltimore	7,083	965,514
Perth Amboy	5,790,791	6,639,259
New York	119,142,439	102,380,382
Total exports	163,623,816	143,872,466

WISCONSIN.

GOGEBIC DISTRICT.

(From our Special Correspondent.)

It is proposed to re-organize and consolidate the Emma, Union and Caledonia mines, with a capital of $300,000, divided into 120,000 shares of the par value of $2.50, the stock to be assessable. These companies are now about $35,000 in debt and this step has been taken to cancel the indebtedness. The work of exploring has been going on up to March 1st, when it was suspended for want of funds.

MINNEWAWA.—At this mine the Germania lense of ore has been struck, and preparations are about completed for a large production this season.

PENCE.—There has been considerable improvement at this mine during the winter. The dike of "soaprock" struck in the vein has been penetrated and a fine body of ore found beneath. Work is also being pushed on the west 40 acres. It is reported a large amount of ore has already been contracted at a very satisfactory price for summer delivery.

SECTION 33.—The force of men now employed will be largely increased, and the production is estimated at 50,000 tons. Both veins of ore are opened on this property.

FOREIGN MINING NEWS.

CANADA.

PROVINCE OF NOVA SCOTIA.

EASTERN DEVELOPMENT COMPANY, LIMITED.—We are officially advised that at the Coxheath copper mine, Cape Breton, development is still vigorously continued. The main shaft is down to the third level, 244 feet; one larger stringer of ore had passed out of the slope to the north, and another was just coming in in the bottom. These stringers are part of vein C, which will be cut from this level. Vein B will not be cross-cut to until the next level is reached. Connection between the first and second levels in vein B has been completed by the up slope from the second level; the vein holds in width and quality of ore. The west drift of the second level is now coming in with rich purple and yellow ore. Letters from the mining captain in charge state: "It is the best showing yet made in this rich vein." South cross-cut into the mountain has entered a change of rock, and cut stringers dipping to the north same as the other veins, but nearer perpendicular. It is expected to soon cut vein E at this point. Five ladders and buckets have been provided for all the surface buildings, and the force organized into a fire brigade. The company has received official assurances from Ottawa that the Dominion government will furnish the rails for the proposed railroad from the mine to Sydney Harbor. Reports from Messrs. Humboldt & Co., of Kalk, Germany, on the treatment of the low-grade ores sent them, show that the 2·25 per cent ore was concentrated up to 9·50 per cent, and the 3·46 per cent was carried to 12·61 per cent, showing conclusively that the low-grades can be handled to advantage.

PROVINCE OF ONTARIO.

CUYAHOGA MINING COMPANY.—The real estate owned by this company has been sold to J. H. Wade, Jr., of Cleveland. The property consists of nearly nine hundred acres of land in the Porcupine Mountain District and is considered valuable. The charter of the company is about to expire and the owners thought best to close out the estate.

MEXICO.

MONTEREY & MEXICAN GULF RAILROAD COMPANY.—As the JOURNAL has already stated, this company is engaged in building a railroad through the States of Nuevo Leon and Tamaulipas, from Monterey to Tampico, a distance of about four hundred miles. The work is being pushed to completion with energy and perseverance. The road is bonded at $25,000 a mile.

At the company's offices in New York this week, Mr V. A. Wilder, the Secretary and Treasurer, was seen by a representative of the ENGINEERING AND MINING JOURNAL. Mr. Wilder said: "Our road holds a valuable concession granted by the Mexican Government to Gen. Geronimo Trevino, who is the President of our company. This concession is extremely liberal, and is probably the last of such a character that will be granted. Work was commenced last September. We have now about sixty miles of road graded from Monterey, and twenty-five miles of track have been laid. The road is now open for traffic to Cadareyta, a distance of twenty-two miles from Monterey. We have all the necessary rolling stock for this distance, including some 60 flat and box cars, three passenger coaches, and several engines. For the first 80 miles we will use pitch pine ties, after that we will take mahogany and other hard woods from the woodland along the line. The Mexican Government has accepted the road for a length of 40 kilometres, and has regulated our schedule of rates. The entire road will probably be completed in a year and a half. The territory through which the road passes has an aggregate population of 550,000 people, and is wonderfully rich in timber and in agricultural products; especially sugar, rice, corn, oranges and other fruits. Considerable mineral territory will also be tributary to it, the old mining districts of San José, San Nicholas and San Carlos being made much more accessible than hitherto. Tampico is now the Gulf port of all this region and the road will furnish an outlet for all its varied products." The officers of the company are: General Gerònimo Treviño, President; T. S. Bullock, Vice-Presidentand General Manager; Frank R. Brown, 2d Vice-President; V. A. Wilder, Secretary and Treasurer.

YAQUI RIVER PLACER MINING COMPANY.—This company, recently formed in Chicago for the purpose of developing and operating the extensive placers of the Yaqui River, in the State of Sonora, has completed all the preliminary preparations and work will begin at the mines at once. These placers have been worked for years in a crude way by the Indians, who have reaped a rich harvest of gold and have held it from all comers until recently. The Yaqui River affords an abundance of water, being navigable for barges almost to the foot-hills of the mountains.

MEETINGS.

Santa Rita Copper and Iron Company, No. 4 Bridge Street, New York, May 8th, at eleven o'clock A. M. W. J. Downings, Secretary.

United States Wood Vulcanizing Company, Nineteenth street and Avenue B, New York City, May 4th, at one o'clock P. M. Wm. F. Holcomb, Secretary.

DIVIDENDS.

Alaska Mining and Milling Company, of Alaska Territory, paid a dividend of 25 cents a share, in San Francisco, on April 13th.

Boston & Colorado Smelting Company has declared an extra dividend of 10 per cent, payable April 25. This makes 20 per cent from the profits of the year ended April 1st, 1889.

Evening Star Mining Co., of Colorado, dividend No. 58, twenty-five cents per share, or $12,500, payable April 18th at 53 Broadway, New York City.

Mt. Diablo Mill and Mining Company, of Nevada, dividend No. 13, twenty cents per share, or $10,000, payable 24th, in San Francisco.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
†Big Hole Placer, Utah	...	Feb. 25	Apr. 8	May 6	.005
Bulwer Cons., Cal.	5	Apr. 10	May 15	June 12	.25
Bodie, Cal.	10	Mar. 27	Apr. 13	June 4	.50
Exchequer, Nev.	27	Apr. 2	May 7	May 28	.25
Eureka Cons, Nev.	11	Mar. 19	Apr. 27	May 20	.50
Found Treasure, Nev.	5	Apr. 10	May 16	June 6	.12½
Grand Prize, Nev.	20	Mar. 15	Apr. 20	May 13	.30
Gray Eagle, Cal.	12	Mar. 19	Apr. 23	May 14	.05
Honorine, Utah	...	Apr. 2	May 2	June 1	.05
Mexican, Nev.	37	Mar. 5	Apr. 10	Apr. 30	.25
Mono, Cal.	27	Feb. 28	Apr. 2	May 8	.50
North Commonwealth, Nev.	2	Apr. 4	May 8	May 30	.30
Occidental Cons., Nev.	4	Apr. 8	May 13	June 5	.50
Peerless, Ariz.	12	Mar. 25	Apr. 26	May 21	.25
Potosi, Nev.	32	Apr. 10	May 15	June 5	.50
Ruby Hill Tunnel & Mg. Co., Nev	17	Mar. 12	Apr. 20	May 20	.01
San Francisco Copper	3	Mar. 18	Apr. 23	May 21	.10
Sierra Nevada, Nev.	94	Mar. 5	Apr. 9	Apr. 29	.25
Sierra Union, Cal.	1	Apr. 10	May 13	June 5	10.00
Taylor M. & M., Cal.	17	Mar. 30	May 1	May 18	3.00
Trinity River T. & Mg., Cal.	1	Apr. 11	May 14	June 3	.07½
Yellow Jacket, Nev.	46	Mar. 28	May 1	June 1	.50
Utah, Nev.	6	Mar. 5	Apr. 10	Apr. 29	.25

* Delinquent day and day of sale postponed to dates given above.

† An additional .005c. a share is payable May 6th, delinquent May 8th and saleable June 10th.

MINING STOCKS.

New York.

THURSDAY EVENING, April 25.

There has been a very fair inquiry for mining shares this week, particularly for the better grade of securities, but such investments do not appear to be in sufficient number on the local exchange to induce heavy transactions or to awaken much speculative interest.

There has been some pressure to sell Horn Silver because of rumors to the effect that the report of the expert, who recently visited the mine, is unsatisfactory and disappointing. This report is in the hands of the printer. We have been unable to see it as yet. Secretary Harrison said to-day that the report is considered to be very fair and accurate, and certainly is not disappointing to those who do not entertain extravagant ideas of Horn Silver bonanzas, etc. Mr. Harrison will issue a quarterly report next week, which will show that the total ore sales for January, February, and March, 1889, were $70,000, and the total working expenses $28,000. The price of the stock declined from $1.35 to $1.20. Ontario shows a few sales at $34 50 to $35.

El Cristo has been let alone this week by those supposed to be on the "inside," and the sales on record are not particularly significant. The confidential advice that "Cristo is a purchase" is still going the rounds. On account of its age alone, this information should be entitled to veneration. The treasurer of the company tells us that he expects more bullion on the next steamer from Honda, due in New York next week. The price declined from $1.80@$1.50.

Messrs. Lounsbery & Co. inform us that the cash balance of the Homestake on March 1st, according to advices received this week, was $10,481, against $16,156.19 on February 1st. The gross product for March, as given in last week's JOURNAL, was $79,073, which is about the usual amount, and presumably yielded the usual profits. A dividend of $25,000 was paid on March 25th, and one of $12,500 on April 25th. Upon being asked directly this week by an ENGINEERING AND MINING JOURNAL representative if the management of the company had been selling its stock, Mr. R. P. Lounsbery, of Lounsbery & Co., said that, although the question was the most impertinent one he had ever heard asked of an officer of a company, he did not object to stating that there was not a word of truth in such a report. Mr. Lounsbery then pointed to the comparatively small amount of stock that has actually been sold, and seemed to regard the decline simply as the result of the reduction of the dividend combined with "newspaper talk." Since the decline really began, March 20th, nearly six weeks ago, the aggregate transactions in this stock have been 5340 shares. A small sale was made to-day at $6.50, the lowest price yet reached. At the close, $7¼ was bid for 100 shares. Deadwood Terra shows a sale at $1.50. Caledonia at from $3.05@$3.10. Sullivan Consolidated was again active and steady at from $1.30@$1.35.

Eureka Consolidated advanced from $1.95@$2 on Tuesday to $3 this afternoon. The stock is in good demand, and very little is offering. As the JOURNAL stated some weeks ago, the present management of the company has taken nearly all the stock that has been offered.

Barcelona shows one transaction at 58c.

Little is doing in the Tuscaroras. The only sales were in Belle Isle at 20@21c.

Consolidated California & Virginia declined from $9@$8 13; Yellow Jacket from $4.05@$3.35. Sierra Nevada was quoted at $4.10 and Savage at $3.05. Ophir went from $7@$6, and later advanced to $8.63. Hale & Norcross ruled at from $4.40@$4.60. Gould & Curry at $2.90. Chollar at $2.40. Belcher at $3.90@$3.95. Union Consolidated declined from $6.38@$6.25. Mexican from $7.50@$4.70. Exchequer at $1.10. Bullion went from $1.30@$1.10. Best & Belcher ruled at from $4.50@$4.60, and Alta declined from $2.35@$2 15.

Sutro Tunnel stock shows only one sale at 9c., and the Trust Certificates one at 57c.

Mutual continued the upward movement and went from $1.20@$1 45.

Rappahannock shows no change; it sold at 8c.

The Bodies shows an upward tendency.—Bodie Consolidated however shows an advance from $1.30 to $1.75.—Bulwer from .30 to .40c., and Mono from $1.35 to $1.75.

There were a few sales of Brunswick at 8c.@9c.

Plymouth shows one transaction to-day at $10.50.

Quicksilver Preferred, one at $37.75.

Two hundred shares of Hector sold to-day at 20 to 25c., assessment paid.

Amador was neglected and was dealt in only on Saturday, when it sold at $1 55.

Astoria was firm all week at 20c.

Middle Bar received no attention. One sale is recorded at 31c.

There was considerable activity in Aspen, which advanced from $11 to $11.50, and later declined to $11. Iron Silver was also in demand, selling at from $2 75 to $3. Little Chief was firm at from 24 to 27c., and Pluuus at $1. Small Hopes was quiet at $1.10. Dunkin at 95c. Silver Cord received attention at prices ranging from 88 to 80c., and Lacrosse at 9@10c.

The boom in United Copper has "petered" out. The price, which last week advanced from $1.50 to $2 25, declined from the latter quotation to $1, at which price sales were made to-day; the transactions amounted to 1900 shares.

Moulton continues to attract attention, and advanced from 20c. to 25c.

Silver King was not dealt in until to-day, when it sold at from 80c. to 85c.

Boston.

April 25.

[From our Special Correspondent.]

The occurrence of two holidays the past week had a tendency to restrict business in copper stocks, although the tone of the market was much better, and there was more disposition manifested to buy the favorites, on the presumption that they were about low enough. This was evident from the orders to buy Calumet & Hecla, which jumped from $202 to $210, and only lost 50c. per share of the advance in the later dealings, on sales of about 400 shares.

Boston & Montana was dull enough for this stock, but showed considerable strength, advancing to $31½, but lost the advance, and sold to-day at $30½, same as last week's closing.

Franklin lost $½, selling at $9¼, but very little doing in it.

Atlantic also declined $½, with sales at $9.

Osceola gained $¼, selling up to $10 and closing at $9⅞.

Tamarack was in good demand at an advance of $8, selling up to $109.

Santa Fe. sold quite freely at 62½@60c., some 3000 shares going at the latter price.

The above stocks comprise all the dealings, and serve to show the extreme dullness prevailing. There is no gossip regarding the future outlook of copper. The price of ingot seems to be steadily declining in London, and indications point to still lower prices, unless some combination is made to sustain the market. Under these conditions there is not much prospect of a bull market in copper stocks for the present.

Silver stocks continue dull, Dunkin selling at 90c., ex dividend.

LATER PRICES.

(*By Telegraph*) April 26th, one o'clock P. M.—Boston & Montana declined ½ to 30, and other copper stocks continue unsettled. Tamarack, 107; Calumet & Hecla, 109¼; Alouez, 1 bid; Atlantic, 9¼ bid.

San Francisco.

The market presents little encouragement as yet. It seems to be the prevailing belief that the mining magnates of the Coast will sooner or later inaugurate an upward movement, if for no other reason than to protect their long stocks. The quotations by telegraph from San Francisco to-day were as follows: Best & Belcher, $4.20; Belle Isle, 25c.; Eureka, $3.10; Mexican, $4.95; Union, $4.95; Utah, $1.40; Yellow Jacket, $3.35; Consolidated California & Virginia, $8.

St. Louis.

April 24.

[From our Special Correspondent.]

It would seem as if holders of Granite Mountain are always to be the recipients of the most favorable reports from their property; the history of the mine is but one succession of rich finds and large shipments, and only at one time did its future ever appear cloudy or dark. This was some months ago, when a large "horse" was encountered in the lower workings, and although the confidence of the larger holders was unshaken, a great many of the small fry rather looked upon it as an unfavorable omen. Last week, however, their suspense was relieved by the discovery of a rich body of ore beneath the "horse." This assures the future of Granite, and with a 160-ounce rock in their lower workings, and an average of 100 ounces above their number 9 level, those interested in Granite may well congratulate themselves upon being the owners of a stock that for years to come is a sure payer. The stock is very firm at $49.50 bid. Bi-metallic likewise holds up well, and is very steady at $40.50 bid.

The lower priced stocks have changed but little. Silver Age, which, by the way, will astonish the natives before long, is strong at $3.12½ bid. The developments of the property, I am told, are exceedingly favorable. The mine is excellently managed—indeed, a more capable, honest and conservative management could not be found. Large bodies of ore have been opened up, and now that connections have been made between their shaft and tunnel, shipments on an extensive scale may be looked for within the next sixty or ninety days.

'Frisco was given a little razzle-dazzle to-day, and run down to 38¾c. At that point, however a good demand set in and all that was offered was taken, the market closing at 42½c. bid. Recent reports from the property are quite favorable.

Whilst the business of the week has not been large, it has been quite satisfactory, and, on the whole, brokers can have no reason for complaint.

CLOSING PRICES.

	Bid.	Asked.
Adams, Colo	$ .25	$ .26¼
Anderson, Mont	.22½	.28¾
Aztec, N. Mex	.22½	.25
Bi-Metallic, Mont	40.50	41.50
Black Oak, Cal	.47½	.50
Carriboo, Idaho	.15	.17½
Central Silver	.22½	.30
Concepcion, Mex	.10	.12
Dinero, Colo	.08	.09
Golden Era, Mont	.14	.15
Golden King	.38¾	.40
Golden West	1.05	1.10
Granite Mountain, Mont	49.50	50.50
Hope, Mont	4.25	5.25
I. X. L., Colo	.07½	.08
Jumbo, Colo	.14	.15
Mary Foster, Colo	.03	.03⅛
Major Budd, Mont	.10	.12
Mexican Imp., Mex	.26¼	.27½
Mountain Key	1.70	1.75
Pat Murphy, Colo	.36¼	.37½
Neath, Colo	.30	.31¼
Phillips, Colo	1.20	1.25
San Francisco, Mont	.42½	.45
Small Hopes, Colo	1.00	1.10
Silver Age, Colo	3.12½	3.25
West Granite, Mont	1.17½	1.20
Wire Patch	.30	.32½
Yuma, Ariz	.50	.15¼

Gogebic Stocks.

[From our Special Correspondent.]

MILWAUKEE, April 18.

There has been comparatively little change in Gogebic stock since you published my annual report (January 12th, 1889). The following quotations are about as nearly accurate as can be ascertained. The last dividend of $5 on the Norice (Metropolitan) has

materially strengthened that stock, and very little can be had at the market. Last sales $35, ex dividend. I will send you another report in a few weeks and may then be able to give you further information relative to condition of properties on the range.

Anvil	$1.50	Penn	$1.50
(Full amt. pd. to $3.50.)		Ryan	$3
Aurora	$5 bid.	Superior	75c.@$1
Brotherton	$1 bid.	Sec. 33	$1.50
Emma	15c. bid.	U. I. & L. Synd.	5c.
Germania	$7.50@$8	Wis. L. & M. Co.	10c.
Gogebic I. Synd.	26c. bid.	Bess. Con. Stock	20c.
Ironton	$2	Bess. Con. Bonds	40¢
Iron Belt	75c.	Kathagan Bonds	35¢
Montreal	$9.50@$10	Eclipse Stock	25c.
Norice	$35	Union	25c.
Odanah	$3		

Pipe Line Certificates.

Messrs. Watson & Gibson say that the oil market during the past week has been exceptionally active, and a break to 80 cents was witnessed in face of all the bull statistics, which have heretofore served as a support for the market. Accompanying the break were rumors that Ohio oil had been successfully refined, and that the Standard had made connections between the Ohio and Pennsylvania fields by pipe line, and that the acquisition by this concern of the bulk of producing Ohio lands argued a high appreciation on its part of the merits of the Ohio oil. There was, of course, considerable speculative selling for short account on this break, and as the market was narrow it became oversold, and hence a rally ensued, which carried the price up to 85, about which figure it closed last night.

The Standard people say that while they can refine Ohio oil successfully, that the cost of doing it deprives the process of any great value. The bears say, in reply to this, that if it be once admitted that the oil can be successfully refined, that it will take very little additional experimentation to cheapen the process, and that there must be an equalization between the price of Ohio oil, now selling at from 15 to 20 cents, and Pennsylvania oil, selling at 85 cents. Especially do they emphasize this fact since the oil quoted about 85 cents is old Bradford and Allegany oil, considerably deteriorated by age, and worth considerably less than fresh oil taken from the White Sand pools of Pennsylvania. This fact is attested by the premium paid for the fresh oil of 25 cents per barrel. It follows that since none of the current production of Pennsylvania oil goes into tanks of the National Transit Company that the oil dealt in on the Exchanges grows constantly older, without being freshened at all by the introduction of new oil. Since petroleum is the reverse of wine in respect to effect by age upon it the stock of oil represented by Pipe Line certificates is constantly losing its value for refining purposes, we cannot avoid the conclusion that the petroleum market will break again to 80 cents or lower.

NEW YORK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
April 20	84½	85⅝	84½	85⅝	349,000
22	84¼	85⅛	82	82⅝	967,000
23	82¼	82⅝	80	81⅜	849,000
24	81⅛	83⅛	81	82¾	698,000
25	83¼	85¼	83	85¾	996,000
26	86	86	84⅛	85½	485.000

Total sales in barrels.... 4,344,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
April 20	85	85⅛	84⅜	84½	338,000
22	85	85⅛	82	82⅝	2,430,000
23	82⅜	82⅝	80	81⅜	3,228,000
24	81⅜	83⅛	81	82⅞	1,581,000
25	83	85½	83	85½	1,828,000
26	85⅞	86	84⅛	85½	936,000

Total sales in barrels.... 10,401,000

Auction Sales of Stocks.

The following miscellaneous securities were sold at public auction in New York this week: 50 shares Brush Electric Illuminating Company, of New York, 75; 10 shares the Consolidated Electric Company trust stock, 72; 5 shares Julien Electric Traction Company, 21; 10 shares Keeley Motor Company, par, $50, 30; 50 shares National Heating Company (Parent Co.), 83¾; 100 shares Consolidated Carson River Dredging Company, $1 per share; $3000 Only Chance Mining Company, 6 per cent bonds, due 1883, $4 lot.

Electric Stocks.

The following closing quotations are reported to-day by J. Heron Crosman, New York City:

Stocks.	Par value.	Market price.
Brush	100	32½@ 37½
" Illuminating	100	80 @ 85
Daft	$100	$ 49 @$ 52
Consolidated	100	70
Edison	100	175 @ 187
" Illuminating	100	90 @ 95
Julien	..	20
" Traction	..	15½
United States	100	50 @ 60
" " Illuminating	100	50 @ 60
Westinghouse	50	60 @ 65
Thomson-Houston	..	.....
" " Welding Co.	..	.....

Trusts Stocks.

The following closing quotations are reported today by C. Hudson & Co., members New York Stock Exchange:

American Cotton Oil Certificates		$55¼@55⅝
Sugar Refineries	"	91½@91¾
Distillers' & Cattle Feeders' Certificates		32½@34
Linseed Oil	"	39 @43
Natural Gas	"	95 @98
Standard Oil	"	167 @169
National Lead	"	21⅝@21¾

COAL TRADE REVIEW.

New York, Friday Evening, April 26.

Statistics.

Production of Anthracite Coal for week ended April 20th, and year from January 1st.

	1889. Week.	1889. Year.	1888. Year.
Tons of 2240 lbs.			
P. & Read. R.R. Co.	94,874	1,624,057	1,323,754
Cent. R.R. of N. J.	88,756	1,441,123	1,405,706
L. V. R.R. Co.	167,492	1,870,903	1,538,924
D., L. & W. R.R. Co.	69,234	1,090,733	2,073,322
D. & H. Canal Co.	59,451	1,027,568	1,386,510
Penna. R.R.	63,591	1,002,477	1,285,638
Penna. Coal Co.	7,968	224,926	435,054
N. Y., L. E. & W.	15,000	346,628	267,493
Total	566,366	8,628,415	9,716,401
Decrease		1,087,986	

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1884	7,801,479	1886	9,256,177
1885	7,517,982	1887	9,901,585

Corrected Statistics.—In the table of anthracite production, which appeared in last week's issue of the Engineering and Mining Journal, a clerical error increased the output of the Pennsylvania Railroad Company ten times, and vitiated the totals. The correct figures were: Pennsylvania R.R. Co., week, 58,749 tons; year, 938,886 tons, making the total production for the week ending April 13th, 504,342 tons, and the total for the year to that date, 8,062,049.

Production of Bituminous Coal for week ended April 20th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2240 lbs.	1889. Week.	1889. Year.	1888. Year.
Phila. & Erie R.R.	1,036	26,225	19,798
Cumberland, Md.	55,000	865,803	1,010,921
Barclay, Pa.	2,500	38,503	58,215
Broad Top, Pa.	7,198	126,697	130,610
Clearfield, Pa.	49,434	906,440	1,100,668
Allegheny, Pa.	11,121	294,808	265,808
Beach Creek, Pa.	19,291	407,763	511,147
Pocahontas Flat Top	23,411	453,407	437,959
Kanawha, W. Va.	25,190†	480,831	516,678
Total	194,181	3,600,477	4,051,804

†Week ending April 14th.

WESTERN SHIPMENTS.

Pittsburg, Pa	12,615	185,681	222,100
Westmoreland, Pa.	18,086	464,330	470,952
Monongahela, Pa.	6,769	54,540	85,221
Total	37,470	704,551	778,273
Grand total	231,651	4,305,028	4,829,077

Production of Coke on line of Pennsylvania R. R. for week ending April 20th and year from January 1st, in tons of 2000 lbs.: Week, 81,928 tons; year, 1,366,490 tons; to corresponding date in 1888, 1,180,194.

Anthracite.

The anthracite trade is in a somewhat better condition this week than last. The demand is gaining, but only in tone and the stocks of coal continue to increase notwithstanding the heavy reduction in output during the month. The stock at tide water increased 61,567 tons, the figures being February 28th, 837,216, March 31st, 898,783. The stocks are still increasing this month also. Prices remain about as in the past, though as some of the individual operators are pretty well supplied with orders they have withdrawn their lowest figures, and are now getting somewhat better rates. The companies, of course, maintain strictly schedule rates at tide water.

It is proposed to continue the curtailment of output during the next month, and it is hoped that in a few months more the consumption will resume a normal condition, and will allow of a better output. At present the improvement in the trade is only in the East. From the West we hear nothing but discouraging reports.

The collection of statistics of the production and movement of anthracite coal has formed a very important and, perhaps, the most valuable feature of the anthracite combination.

Occasionally, when some company over-produced its quota, or when stocks at tide-water increased beyond a healthy amount, efforts have been made to suppress the information, but the good sense of some of the officials has, thus far, prevented the complete suppression of the detailed reports, and the publication of these has tended to make the companies more careful in the fulfilment of their obligations.

Recently, it has been asserted, and apparently with some foundation, that the Lehigh Valley Railroad has made inaccurate returns of its shipments and greatly understated them; and the protests which have been made against this serious offense have apparently induced the official statistician, Mr. John H. Jones, to lump all the returns and publish only aggregate figures, thus diverting responsibility for false returns from the offenders.

These anthracite statistics, if accurate, are extremely valuable, but if confidence in their accuracy be destroyed by such a move as the refusal of some of the companies to show their actual output, then it were better not to publish in any form returns that can not be believed.

The neglect to publish the statistics of stocks of coal at tidewater, was due to the fact that, notwithstanding the curtailment of production, stocks have considerably increased and now stand at an unprecedentedly high figure. It may very safely be assumed that all such injurious facts will be largely exaggerated and their injuriousness increased by the rumors that will get in circulation in the absence of reliable statistics. Even now the statement that the Lehigh Valley objects to furnishing its correct figures, has brought about a feeling of uncertainty and insecurity in the market. It is asked "if one road covers up its over-production by erroneous returns and is allowed to do so, what is there to prevent other companies from doing the same, and where, then, will be the combination in a very short time?"

The only way to conduct business satisfactorily is to do it openly and honestly, and the evidence of honesty is to place the data necessary for the detection of dishonesty in the hands of all.

We shall endeavor to give hereafter the usual table of production of each of the companies.

The Philadelphia & Reading Railroad has reduced the prices for furnace sizes of anthracite 25 cents per ton, making the new price $1.85 per ton at the mines. The tolls to furnaces along the Schuylkill Valley have also been reduced an average of eight cents per ton, according to the distance of the furnaces from the mines. These reductions in both prices and tolls were put into effect on the 22d inst.

Four ocean coal barges, of 1000 tons each, are building for New England Transportation Company. They are to be put on a new route between Providence, R. I., and the New Jersey coal docks. The Boston Towboat Company is building several 2000 ton barges to run between Norfolk and Boston.

Bituminous.

There is nothing new to report in this article. Contracts are being closed in the East mostly on the line of last year's business; the same companies taking the same contracts. The Pocahontas Company, we understand, has taken a good many of the Eastern railroad contracts, but most of the Cumberland and Clearfield producers maintain that they have kept their old customers. The rates at which the coal is sold seems yet to be a little uncertain, and no one appears to be satisfied that the producers are living quite up to their agreement, though the manner in which they get around it is not yet generally known.

BOSTON, April 25.

[From Our Special Correspondent.]

The anthracite coal market is better, more active, and healthier in every respect. Coal is not pressing for sale in this market. Vessels are scarce, and retail dealers are beginning to buy. Considerable coal has been sold this week, and jobbers are quite sanguine now that the market will hold. The larger sizes are in only moderate supply, particularly broken, which is most desired now, but which cannot be had at less than $3.70@$3.75 f. o. b. at New York, with Lehigh broken higher. Egg, which is more plenty, is quoted on this market nearly as cheaply as broken, say at $3.75@$3.90 f. o. b. at New York. Stove is plenty at $4.00@$4.15 and some of moderate quality, to say the least, is to be had at $3.85. All the larger sizes are more plenty than the smaller sizes, which are in very short supply, owing not only to the restriction in mining but to the lack of shipments from tide.

There is practically no pea coal to be had for quick shipment, although considerable is wanted in this market. I should quote $2.50 f. o. b. a low price for pea. There is some No. 2 buckwheat to be had say, at $1.65 f. o. b., and some mine culm at $1.55 but very little else. Pea and dust is much in demand, and would command $1.75 f.o.b., but there is none. The Standard Oil Company, which takes 100,000 tons annually, has all there is now, when wharf screenings are not being plentifully made. Unless the supply of small steam sizes of anthracite improves, those depending upon this coal will be obliged to take bituminous, which costs considerably more.

The bituminous market is quite active still, in a quiet way. One item which has made some talk is the taking of the West End Horse Railroad contract for 3500 tons by New River parties through a retailer, H. G. Jordan. The contract is to deliver the coal in teams. Retailers are not allowed by the combination rules to take contracts where time runs over thirty days, and this is a good way, apparently, of getting around it. I hear that other retailers were willing to do the same thing.

It is said that the Deer Island (Boston Harbor) contract was taken at $3.49 alongside.

The Pocahontas people have taken about all the railroad contracts in this section and must have rolled up an immense tonnage, equaling, if not exceeding, their last year's record. It is gossipped that they had the New York, New Haven & Hartford contract for a part, if not the whole, of coal wanted before bids were publicly asked, and that the proposals were invited as a matter of form. It is an interesting question here, and I presume it may also be in New York, whether the Norfolk & Western's coal business is managed primarily, with a view to making money on the coal traffic in itself, or for other purposes. The pool price of $2 60 f. o. b. is being lived up to quite as well as was to be expected. There is some cutting, but the market cannot be said to have broken.

Freights are high and very strong, quoting 75@80c. at New York, $1.05 at Philadelphia and Hampton Roads, and $1.15 as bottom rate at Baltimore. The scarcity of vessels is something of a puzzler to the trade.

Retail movement is slight at old prices.

Receipts for the week were light.

BUFFALO. April 25.

[From our Special Correspondent.]

There is very little information to impart this week relative to the coal trade. There is "nothing stirring but stagnation." No inquiry and no change in quotations. The opening retail rates for anthracite will be published in a day or two. Stocks large, both of anthracite and bituminous. A dealer says "It is the general verdict of everybody who knows anything about the anthracite coal trade that it was never in its history quite so dead as it is just now. Go into the coal offices in the city and half of the clerks are away and the other half are idly holding down their chairs or praying for a ball game." Of course, there is a demand for fuel for propellers, tugs, etc., but that is only a small part of the coal commerce of our city.

Last evening at our Music Hall Fair ten tons of anthracite coal were sold by auction for $150. Your correspondent remembers, in the days of long ago, paying $9 for one ton in the ordinary way.

For several days there was almost a total suspension of chartering vessels with coal for the reason that shippers wanted "gross" tons to be carried at "net" ton rates. Vessel men were firm in their views for the latter basis. On Monday, however, the whole matter was dropped, and a few charters were made at 45c. per net ton to Chicago, Green Bay, and Milwaukee, a decline of 5c.; since, that has been the going figures for the few loads shipped. The majority of the vessels cleared thus far this season departed light.

The shipments of coal by lake from the opening of navigation to April 24th, inclusive, 74,600 net tons, namely: 43,400 to Chicago, 12,780 to Milwaukee, 4100 to Duluth, 2000 to Superior, 1760 to West Superior, 4440 to Racine, 3200 to Kenosha, 2320 to Port Arthur and 600 to Green Bay. The rates of freight were 50@45c. to Chicago, Milwaukee and Green Bay; 50c. to Port Arthur, Racine and Kenosha; 40c. and owner's account to Duluth and Superior, and 20c. to Toledo.

The canals of the State will be opened on May 1st, excepting that portion of the Erie Canal between Albany and Little Falls, which will be opened May 2d, and between Lock 46 and Little Falls about May 4th. The repairs on the break at Knowlesville were finished yesterday.

The legislative committees have reported favorably on allowing $600,000 for next winter's work on the canals; this sum is $400,000 less than that asked for. A million of dollars is not too much; it means only three-tenths of a mill on each dollar of taxable property in the state—a mere bagatelle!

The newspapers have been discussing the probability of the Treasury Department imposing a duty on Canadian railroad cars entering the states. Nothing need be added to what has been written excepting that such an order would have a tendency to interfere with the shipments of coal by rail to the Dominion, and would certainly be the means of advancing freights and transfer charges.

The Inter-State Commerce Commissioners have promulgated the following decision: It appearing that the Grand Trunk Railway of Canada transports coal and coke under a schedule specifying a total rate from Buffalo, Black Rock and Suspension Bridges in the United States to Hamilton, Dundas and several other points in Canada; that the published tariff rates for such transportation from the points named to Hamilton and Dundas is $1.00 per ton, but that it accepts a reduced charge or allows a rebate of 25c. a ton in favor of certain consignees at said points; therefore, held that the reduced charge accepted or rebate allowed is in violation of the act to regulate commerce and unlawful.

PITTSBURG. April 25.

[From our Special Correspondent.]

Coal.—We have no improvement to record; several of the large operators have closed down for the season, others are preparing to do so. There will be sufficient small works left open to supply the local coal demand.

Total shipment for April to date was 8,950,000 bushels and could have been double that amount had it been required.

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.50	Railroad coal	5.00@6.00
Third pool	3.90		

Connellsville Coke.—Prices continue very uncertain, with far more sellers than buyers. There has been a gradual shrinking in the demand. The prospects for an improvement are not very bright. Continued overproduction and keen competition for orders have resulted in producing lower rates. In fact, it looks like as if there was no regular price, being a kind of "go as you please." Quotations are as follows:

Furnace coke	$1.05@$1.10	Crushed	$1.50
To dealers	$1.15	Foundries	1.25

Freight rates from the ovens to Pittsburg, 70c. per ton; to the Mahoning and Chenango valleys, $1.35; East St. Louis, $3.50; Cleveland, $2.80; Chicago, $2.75.

FREIGHTS.

Freight Rates from Pittsburg to Port Huron Points.—The Pittsburg & Lake Erie and New York, Lake Erie & Western roads have announced the following new lake rates from Pittsburg to Port Huron points, to take effect on the 15th inst.: To Marine City, St. Clair and Port Huron, Mich., first class, 40; second, 35; third, 26; fourth, 19; fifth, 17; sixth, 14. Port Sandilac, San Beech, Oceola, Ausable, Alpina, Cheboygan, Mackinac Island and St. Ignace, 60, 50, 36, 24, 22 and 20 cents per 100 pounds. The difference between these and the rail rates ranges from 5 cents to 1 cent on the different classes. Articles of iron and steel have been made fifth class in less than carloads and sixth class in carloads.

Southern Freights.—The Southern Railway and Steamship Association have issued a circular, announcing that on the 1st of May the rates of freight will be based on $2.75 from Birmingham, $2 25 from Chattanooga and $2.50 from Sheffield to Cincinnati, $2.50, $2.25 and $2.25 respectively to Louisville, and $4, $3.75 and $3.75 respectively to Chicago. On the same date a special tariff on manufactured iron was sent out making the rates to Chicago 24 cents per 100 pounds from Birmingham and 22 cents from Chattanooga, 12 and 10 cents respectively to Cincinnati, 14 and 13 cents to St. Louis, and 11 and 10 cents respectively to Louisville, Ky.

The following rates per ton of 2240 lbs. for coal charters are reported:

From Philadelphia to:—Boston, .90@1.05*; Charleston, .70@.75; Fall River, .80@.90*; Georgetown, D. C., 1.00; Lynn, 1.15@1.30*, New Bedford, .80@.90*; Newburyport, 1.15@1.20*; New York, .90†; Norfolk, Va., 55@70; Portland, .95*; Portsmouth, N. H., 1.10*; Providence, .80@.90*; Richmond, Va., .60@.65; Savannah, .80; Washington, 1.00.

From New York to: Boston, .70*; Cambridgeport, .75*; Fall River, .55*; Lynn, .80*; New Bedford, .55*; New Haven, .55; New London, .55*; Newport, .55*; Portsmouth, N. H., .85*; Quincy Point, .70*; Salem, Mass., .70*.

* And discharging. † Alongside.

METAL MARKETS.

NEW YORK, Friday Evening, April 26, 1889.

Prices of silver per ounce troy.

Ap'l	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Ap'l	Sterling Exch'ge.	Lond'n Pence.	N. Y Cts.
20	4.88¼	42 3-16	92¼	24	4.88¼	42⅛	92
22	4.88½	42 3-16	92⅛	25	4.88⅛	42⅛	92
23	4.88½	42 3-16	92⅛	26	4.88½	42 3-16	92¼

Silver market has been dull this week with limited demand but closes firmer. There has not been so strong a demand for Council Bills as last week and the applicants have received a much larger percentage of the amount than they had tendered for.

The United States Assay Office at New York reports total receipts of silver for the week, 70,000 ounces.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in the minimum rate of discount, which remains at 2½ per cent. During the week the bank lost £64,000 bullion, and the proportion of its reserve to its liabilities was raised from 40 65 per cent to 42.36, against an increase from 40¾ to 40⅛ per cent in the same week of last year, when its rate for discount was 2 per cent. The weekly statement of the Bank of France shows an increase of 3,825,000 francs gold and an increase of 750,000 francs silver.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .72	$ —
Mexican dollars	.72½	.73¼
Peruvian soles and Chilian pesos	.72¼	.72¾
English silver	4.83	4.87
Five francs	.94	.95
Victoria sovereigns	4.86	4.88
Twenty francs	3.88	3.92
Twenty marks	4.75	4.80
Spanish doubloons	15.60	15.75
Spanish 25 pesetas	4.82	4.86
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.65
Ten guilders	3.96	4.00

Copper.—Business was interrupted on the London metal market until the 23d inst., owing to the Easter holidays. On the resumption of dealings on Tuesday morning G.M.B. copper opened at £36 17s. 6d. to £37 spot, and £37 2s. 6d. to £37 5s. three months, but relapsed on Wednesday to £36 15s. to £36 17s. 6d. cash, and £37 2s. 6d. three months.

On Thursday, however, on the circulation of various rumors regarding the probability of some arrangement being after all arrived at, as the result of the protracted negotiations in Paris and buying on the part of certain parties supposed to be well informed on the subject, the London market became somewhat firmer, and quotations closed that day at £37 2s. 6d. Spot, and £37 10s. three months. To-day (Friday) the market exhibited increased strength, opening in the morning at £38 5s. to £38 10s.; spot, £38 15s. to £39, three months; but cable advices are to the effect that little business is taking place at the advance.

In the afternoon, prices eased off to £37 17s. 6d. to £38 cash, and £38 to £38 2s. 6d. three months, the heavy decline for future indicating little confidence on the part of operators.

As to the various reports about the mode of dealing with the accumulated stock and regulating the future output, and also fixing the future minimum selling price, nothing authoritative has yet transpired beyond the fact that some of the interested parties want the minimum fixed at £35, while others would like to put it somewhat higher. An important meeting on the question is taking place to-day in Paris, but at the time of going to press no definite information as to any decision come to has reached this side, and it is therefore impossible to say whether the present improvement is simply a speculative spurt or has some substantial ground to stand on. In our domestic market conditions remain precisely the same as previously reported.

The deliveries of lake copper are being made on the unsatisfactory basis formerly mentioned, while the price of casting copper has again been reduced a trifle. For the various kinds of casting copper there are numerous orders in the market, but they are all of a retail character, as consumers will only buy what they need for two or three days ahead. Business has been done in the Metal Exchange to-day at 12c. for good merchantable copper.

The exports of copper from New York during the past week were as follows:

Copper in transit.	Lbs.		
To Hamburg—			
By S. S. Servia	Bbls 8	2,310	$693

Tin.—The demand from consumers is very good, and a comparatively large business has been done, but the London market, which, previous to the holidays, was very steady, and which opened rather firm on Tuesday morning, probably owing to an accumulation of consumers' orders, has since exhibited a declining tendency, and the lowest prices of the week were touched to-day at £91 10s. spot, £92 5s., 3 months.

Shipments from the East are evidently expected to be very heavy this month (especially to Europe), and arrivals in this country will also show an increase. Spot tin, however, still remains very scarce, but transactions for forward delivery took place at the beginning of the week at 20.70 and yesterday one contract for May delivery was made at 20.50. Our closing quotations to-day are spot, 20⅝; May, 20⅝; June, 20¾; July, 20¾.

Lead continues very dull. At the beginning of the week the bullion quotation was reduced to 3⅝, and later on one sale took place (of 50 tons) for May, at 3.65, and subsequently 3⅝ was again accepted. For May and June shipment from the West, the metal is offered at 3 67½. Little business has been done, and the market cannot be reported as in a promising condition.

The Chicago Market.—Messrs. Everett & Post telegraph us to-day as follows: Market steady and active; 800 tons sold during the week, mostly at 3·47½c. At the close market stands at 3·47c½., 3·45c. asked. Spot commands 3·50c.

The St. Louis Market.—Messrs. John Wahl & Co. telegraph us to-day as follows: Market does not show much activity, but, on the other hand, gives no sign of weakness, holders having quite frequent inquiries for small lots, maintaining prices fairly well. It appears to be generally conceded that the market has touched bottom. Towards the close there has been more doing and a better feeling is apparent. Sales will probably aggregate 600 tons at from 3·40@3·45c.

Spelter.—Although quotations are still rather irregular, the tone is fairly steady, and we quote prime Western 4.62½ to 4.65. New York Silesian spelter cannot be imported into this country under a cost of about 5¾c., and this large difference in price, as compared with the domestic metal, limits the demand within the narrowest bounds. In London the quotation for specials is £17 10s., and for ordinaries, £17 7s. 6d.

Antimony continues in fair demand; Hollett's at 12c., and Cookson's at 13½c.

Quicksilver.—London quicksilver market and statistics especially reported for the ENGINEERING AND MINING JOURNAL by Messrs Markwald & Co.:

Stocks 1st March (first and second hands):		
Spanish and others	57,700	bottles.
Imports from Spain during March	13,000	"
" " other countries	1,300	"
	72,000	"
Export during March:		
To Hongkong, about	2,500	
To New York, "	400	
To Bombay and Calcutta	500	
To Continent and other countries	2,600	
Home consumption, estimated	1,500	
	7,500	"
Stock on 1st April, 1889	64,500	"

BOARD OF TRADE RETURNS OF IMPORTS INTO AND EXPORTS OF QUICKSILVER FROM ENGLAND, 1889.

Imports, January, 1889	7,250	flasks.
" February, 1889	8,546	"

Exports to:	Jan.	Feb.
Russia, Norway, Sweden and Denmark	11 Fl.	17 Fl.
Germany	220 "	592 "
Holland and Belgium	79 "	130 "
Channel Islands	6 "	11 "
France	400 "	360 "
Spain and Portugal	21 "	47 "
Cape of Good Hope and Natal	9 "	6 "
Madras, Bombay and Bengal	333 "	520 "
China	812 "	1,050 "
Japan	400 "	36 "
N. S. Wales, Victoria, Queensland and S. Australia	138 "	271 "
New Zealand	... "	10 "
United States, N. A	629 "	500 "
Mexico	650 "	580 "
Central America	10 "	14 "
Columbia, Br. Guiana and Venezuela	54 "	10 "
Brazil, Argentine Rep., Uruguay and Bolivia	... "	171 "
Peru and Chile	720 "	256 "
	4,492 "	4,471 "

The market has ruled very steady during the whole month of March, although there has been an entire absence of speculation. All buying was bona fide for export or home consumption, and large orders were

left unexecuted in consequence of holders deciding to sell but at an advanced price. Rothchild's price is £7 15s., and second hand £7 13s. 6d. China has advanced about $3 per bottle during the month, and at the time of writing orders for Hongkong to the extent of several thousand bottles are still in the market at prices a little under above values. but no sellers under them. During the first three months of this year export and home consumption have taken away 22,000 bottles from our stocks, and if the demand continues at the same rate we shall see much higher prices as soon as the imports from Spain have come to an end, viz., in June.

Through the courtesy of Mr. J. B. Randal we are enabled to give the production of California quicksilver this year, as follows:

January	2,221 flasks.
February	1,670 "
March	2,095 "
	5,986 "

The London *Economist*, of April 13th, gives the imports and exports from Great Britain as follows:

	Imports. pounds.	Exports. pounds.
January	543,925	336,995
February	640,962	335,996
March	494,367	581,444
	1,679,254	1,254,438

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 26, 1889.

The approach of the Centennial celebration has almost paralyzed what little business we have had to report during the past few weeks. At present everyone is talking of the Centennial and no one of business, though, indeed, it makes but little difference, for the transactions that are recorded are small in amount and of such a character as to create no stir in the market at any time. During the whole of next week we expect very little business will be transacted here; Monday, Tuesday and Wednesday being holidays.

There is no improvement in pig-iron; on the contrary, we hear of rather lower figures for Southern irons than we have been reporting. Otherwise our quotations remain unchanged, at $17@$18 for No. 1 Foundry, $16@$17 for No. 2 and $15@$16 for Forge.

Scotch Pig.—This market has almost ceased to take the foreign article owing to the advance in Scotch quotations and the decline in American pig. We continue our recent quotations for the brands which are still brought in, but the imports are only for manufacturers who still consider the Scotch iron as a necessity in their trade.

Steel Rails.—There is but little worthy of note to report in this article either; prices continue at $27 at Eastern mills, though, it is said, a little less than this has been taken for a recent lot of about 5000 tons for a Southern road. The Louisville & Nashville contract for 15,000 tons has gone to a Pittsburg mill at very low figures. No improvement has as yet made its appearance in the railroad business, and the outlook is not encouraging, though we still hope for a considerable increase in the orders later in the season, and commencing in about sixty days from now.

Structural Iron and Steel.—This article is in better demand owing to the revival of building in the Northern cities. Several large contracts have been reported, but the prices remain as they have been; that is, for sheared plates about 1·85c. to 2c.; angles about the same; tees, 2·3c. to 2·5c., and channels and beams, 2·08c. on docks.

For bar iron plates and other manufactured forms the demand continues moderate, with no improvement in prices and rather a dull tone as regards the future.

Old Material.—We note sales aggregating about 2000 tons of old rails at $22 Eastern delivery. A fair quotation would be $22 to $23, but the demand is very light, and the railroads having old material to sell dispose of it mostly in exchange for new material of some kind. We continue our quotations for the different articles in our usual table of current prices on another page.

CLEVELAND. April 24.

[From our Special Correspondent.]

The iron ore market is quiet and unchanged. A sale of 10,000 tons extra low phosphorus ore from Marquette County to an Eastern furnace is reported at $6.30 per ton, delivered at Buffalo. This ore will run 66 in iron, and not over ·02 in phosphorus. One of the largest charcoal iron companies of Lower Michigan appeared in town to-day, and closed contracts for three-fourths of the quantity of ore which they will need until the opening of navigation next year.

Some ore consumers are still holding off, hoping to get their supply at last year's prices, but the ore men are generally asking an advance, averaging about 25c. Below are present actual cash selling prices at Lake Erie ports:

Extra low phosphorus speculars from Marquette County	$6.25
Standard specular Bessemers, 66 to 68 per cent.	5.75
" non " 66 to 68 per cent.	5.25
" soft hematite Bessemers 58 to 61 per cent.	4.75 to 5.50
Standard soft hematite non-Bessemers	3.75 to 4.25

LOUISVILLE. April 23.

[Special Report by Messrs. HALL BROTHERS & Co.]

Aside from a good average run of small orders there is nothing of importance to report, with the exception, perhaps, of one lot of nearly 2000 tons of No. 2 Foundry having been sold at very much reduced prices, for delivery running about nine months into the future. There are but few buyers for round lots and in many cases these contemplated purchases are reduced to small amounts, the buyers preferring to wait for lower figures.

Quotations, which are for cash f.o.b. cars Louisville, will be found in our weekly register of prices.

PHILADELPHIA. April 26.

[From our Special Correspondent.]

About the only danger consumers of iron are in at present is the possibilty of a general movement on their part to cover summer requirements. Should this set in, it is generally anticipated that an advance would take place from actual selling prices. A great deal of iron is being offered for forward delivery, but very little for immediate delivery. The feeling exists that there is to be a better trade condition all around. Some companies have had offers for summer deliveries, but up to this time have not accepted them. Considerable Southern iron has been offered within the past two or three days at prices ranging from 50 cents to $1 below competitive brands. On the surface of trade there is not a single change in the situation. Below the surface there is a little uneasiness that something may happen that will work in favor of buyers.

In mill irons there is a little accumulation, but there is no accumulation of standard brands of foundry. Prices are nominally unchanged, but each side is claiming that the situation is working in their favor. Nearly all the bloomeries throughout the States, so far as reports run here, are in good shape. Occasionally a little lull occurs here and there, but the general consumption of all kinds of blooms is heavy. Full prices are quoted, and very seldom do we hear of concessions. There has been a general drop off in the demand for muck bars. Buyers seem to think a farther drop of fifty cents will follow, owing to the sold-out condition of the mills. The exhaustion of supplies among small users have driven a number into the market for small lots since last week. A good many car builders have made offers at about $2 per ton below quoted prices. With some mills it is a question of running at cost or shutting down. Nothing has as yet transpired with reference to the rumored shutting down of mills. There is nothing new in skelp iron.

The agitation in favor of a restriction of the nail production has helped demand wonderfully, but in a retail way. Nearly all buyers are purchasing small lots. The extremely low quotations are being accepted on old options, but there is a tendency to stand out for slightly higher prices. The market is working around into better shape.

Several large contracts for plate iron have been placed within a few days. Large contracts have been placed for pipe iron. The total contracts for tank and plate for the past week foot up about 2400 tons. A hardening of prices to retail buyers, should they wait a little longer, is likely to take place.

A large amount of structural iron business is about coming in. Bridge builders will be the heaviest buyers as usual. Ordinary building requirements are becoming a more important factor every week. Quotations are unchanged on sheet iron of all kinds. Very few old rails are selling. The holders think that prices will harden as soon as the mills pick up work enough to guarantee them a steady summer's run. Several lots of steel rails were contracted for and a better feeling prevails. Hardly anything is being sold in

IMPORTS AND EXPORTS OF METALS AT NEW YORK APRIL 15 TO APRIL 22, 1889, AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co		67
Lamarche's Sons, H		5
Naylor & Co		33
Total		105
Corres. date, 1888	25	313

Nickel.	Lbs.	Lbs.
McCoy & Sanders		11,240
Total		11,240

Antimony.	Casks.	Casks.
Total		964
Corres. date, 1888		1,423

Pig Lead.	Lbs.	Lbs.
Erie Dispatch		17,428
Foley, E		85,000
Henderson Bros		22,445
Hendricks Bros		111,977
Total		236,850

Tin.	Tons.	Tons.
Amer. Metal Co	17	245
Bidwell & French	177	345
Bruce & Cook		7
Carter, Hawley & Co.	11	11
Crooks & Co		88
Daval & Son, John		11
Hendricks Bros	11	70
Knauth, N. & Kuhne	10	10
Lehmarer, S. & Co.	11	57
Mendel & Tompkins	1	1
Muller, Schall & Co	38	678
Naumann, F		1
Naylor & Co	17	701
Phelps, Dodge & Co	112	1,372
Pope, J. E., Jr		118
Schmarer & Co		11
Thomsen, A. A		140
Thomsen, D		75
Wheeler & Co		1
Total	405	4,183
Corres. date, 1888	100	3,609

Tin Plates.	Boxes.	Boxes.
American Metal Co		30
American Metre Co		299
Brown & Co., V. H		350
Bruce & Cook	1,827	40,080
Byrne & Co., J		7,583
Central Stamp. Co.	1,397	38,046
Coddington & Co	5,044	63,568
Cohen, S. M		272
Cohn & Co., H		2,916
Con. Fruit Jar Co		303
Cort & Co., N. L	6,561	41,523
Corbier, F. & S	323	1,455
Crooks & Co	1,304	42,423
De Milt & Co	1,812	7,349
Dickerson, V. D	12,003	130,339
Erie Dispatch		103
Foley, E		39
G. L. N		72
Holder & Herrick		271
Iron Clad M. Co		283
Ismay, J. B		350
Lalance & G		5,988
Lombard, Ayres		3,000
Merchant & Co	170	5,130
Mersick & Co		4,556
Morewood & Co	3,000	7,030
Newell Bros		150
Payne & Son		208
Phelps, Dodge & Co	28,433	214,960
Pratt Mfg. Co	8,703	77,923
Sanders Bros		479
Shepherd & Co	1,515	12,869
Somers Bros		569
Taylor & Co., N. & G		214
Thomsen, A. A	1,185	80,628
Warren & Co., J. M.	508	3,134
Wheeler & Co		6,234
Whittemore & Co	2,550	10,560
Wolff & Reesing	316	500
Total	75,651	791,869
Corres. date, 1888	35,591	549,307

Pig Iron.	Tons.	Tons.
Bartlett, N. S		500
Crocker Bros	300	2,720
Crooks & Co		500
Henderson Bros		166
Godwin & Son, A. G		390
Irwin & Co., R		100
Martin, W. T		150
Naylor & Co		50
Page, Newall & Co		60
Perry & Ryer		125
Pope, J. E., Jr		250
Sheldon & Co., G. W		200
Stetson & Co		2,400
Walbaum & Co		250
Williamson & Co	200	1,125
Total	500	8,836
Corres. date, 1888	1,625	18,846

Steel Sheets, Billets, Forging, etc.	Tons.	Tons.
Abbott & Co	159	2,251
Ames, W. T		253
Baldwin Bros. & Co		15
Belcher, H. W	11	64
Bowker, C. F	16	100
Carey & Moen	12	108
Carter, G. F		200
Coddington & Co		21
Crenshaw, Hugh		27
Crooks & Co		285
Cortis, R. J	50	408
Curran, J		5
Dana & Co	1,464	8,055
Downing & Co	23	131
Erie Despatch		40
Hugill, Chas		84
Ismay, J. B		174
Lalance, & G		106
Leng's Sons, J. S		114
Lundberg, G		51
Mersick & Co		5
Milne & Co		1,204
Naylor & Co	251	2,131
Newton & S		21
Oelrich & Co	78	269
Pierson & Co	42	276
Pilditch, F. S	15	67
Power, C. W	4	36
Prosser, Thos		386
Roebling's Sons		101
Schulze & R		7
Standard Oil Co		112
Strouse & Co., M		6
Temple & L		12
Wagner, W. F	15	309
Wallace & Co		5
Whitney & W		30
Wiel Elie		44
Wiell & Co		7
Williams & W		93
Wolff, R. H	32	246
Total	2,172	17,852
Corres. date, 1888	325	2,167

Bar Iron.	Tons.	Tons.
Abbott & Co., J		670
Bacon & Co		87
Downing & Co		230
Jacobus, E. G		17
Milne & Co		89
Muller, Schall & Co		10
Ogden & W		7
Plenty, John		2
Troment, F		440
Wells, F., & Co		15
Total		1,572
Corres. date, 1888	96	1,918

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co., J	50	1,151
American S. Co		450
Boker, H		3
Bruce & Cook		8
Carey & Moen		370
Crabb & Co., W		15
Dana & Co		1,915
Downing & Co		580
Fuller, D. & T		11
Galpin, S. H	11	76
Hazard Mfg. Co		20
Heyn, A	75	1,154
Lilienberg, N		56
Lundberg, G		56
Lundell, C. G		50
Milne & Co		301
Montgomery & Co		16
Muller, Schall & C.		202
Naylor & Co	327	7,249
Nichols, B. J		10
Page, N. & Co		274
Pratt Mfg. Co		30
Roebling's Son		769
Wheeler & Co., E. S		120
Whitney & Co		70
Wolf & Co	106	2,248
Wright, P. & Co		3
Total	669	17,856
Corres. date, 1888	1,077	21,541

Old Rails.	Tons.	Tons.
Baldwin Bros. & Co		240
Bowring & A		57
Crossman & Bro		320
Henderson Bros		150
Neumark & Gross		3,186
Perkins, C. L		433
Perry & Ryer		177
Sheldon & Co		203
Ward & Co., J. E		21
Total		4,787
Corres. date, 1888	100	5,602

Scrap Iron.	Tons.	Tons.
Burgass & Co		162
Downing & Co		250
Funch, E. & Co		397
Spaulding & Co		172
Ward & Co., J. E	74	269
Watjen, F. & Co		152
Total	74	1,402
Corres. date, 1888	70	1,962

Sheet Zinc.	Lbs.	Lbs.
Crooks & Co	220,468	276,468
Lemarch's S's, H	220,468	278,022
Total		57,554

Sheet Iron.	Tons.	Tons.
Coddington & Co	11	346
Downing & Co		16
Kelly, Hugh		5
Total	11	367
Corres. date, 1888	40	56

Charcoal Iron.	Tons.	Tons.
Bacon & Co		97
Downing & Co		571
Lilienberg N		6
Milne & Co	6	94
Muller, S. & Co		110
Naylor & Co		45
Page, N. & Co	105	704
Total	111	1,207

Spiegeleisen.	Tons.	Tons.
Abbott & Co	150	350
Blakely & McLellan	230	2,101
Crocker Bros	820	4,522
Dana & Co	1,000	3,786
Farris & Co		325
Geisenheimer & Co.	25	85
Jansen, J. A		6,920
Naylor & Co		7,839
Perkins, C. L		1,401
Walbaum Bros		675
Total	2,425	28,407
Corres. date, 1888	1,000	17,364

Iron Ore.	Tons.	Tons.
Earnshaw, A	295	3,515
Total	295	3,515
Corres. date, 1888	296	10,190

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co		463,109
Amer. Metal Co		585,050
Hurst, F. W. J		113,000
Naylor & Co		1,197,024
Orford, C. & S Co		112,013
Piper, D. & Co		3,898
Seaman, Sam'l H		141,800
Total		2,615,894
Corres. date, 1888		18,076,885

Copper Matte.		
Abbott & Co		427,613
Amer. Metal Co		2,876,355
Am. & Paterson		134,220
Clark, W. A		879,019
Henriott, F		5,083,269
Seaman, Sam'l H		13,000
Wil'ms, Terhune		692,494
Total		10,105,968
Corres. date, 1888		22,375,111

Old Copper.		
Burgass & Co	17,751	32,460
Total	17,751	32,460
Corres. date, 1888		181,608

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS.

Acid—Acetic, ℔ 100 lbs..... 2.00@2.25
Muriatic, 18°, ℔ 100 lbs ... .. 1.15@1.20
Muriatic, 20°, ℔ 100 lbs..... .. 1.35@1.50
Nitric, 36°, ℔ 100 lbs ... . 4.00@5.50
Nitric, 42°, ℔ 100 lbs..... ..... 5.50@7.00
Oxalic, ℔ 100 lbs..... ....9.50@10.50
Sulphuric, 60°, ℔ 100 lbs. ..... 90@95
Sulphuric, 66°, ℔ 100 lbs ..... 95@1.25
Alkali—36 p. c..... .. 1.12½@1.15
Refined, 48 p. c ..... 1.22½@1.25
Refined, 58°..... .....1.15@1.20
Alum—Lump, ℔ lb..... .. .... 1¾
Ground, ℔ lb.. .... 1⅞@2
Lump, ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton..... £4 10
Aqua Ammonia—18°, ℔ lb..... 4¾
20°, ℔ lb..... 6
22°, ℔ lb.. .... 6@7
26°, ℔ lb..... .. .. 10@11
Ammonia—Sul., ℔ 100 lbs.. 3.30@3.35
Carb., per lb..... 7½@8½
Muriate per lb.. ..... 6¾@ 8
Arsenic—White, powdered, ℔ lb...3@3½
Red. ℔ lb..... 7
White, at Plymouth, ℔ ton. £12 2
Asbestos—Am., p. ton..... $50@$300
Italian, p. ton, c. i. f. L'pool..£18@£60
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb .. .. 4½@5½c.
Hard, ℔ ton..... .. .. $28.00
Trinidad, refined, ℔ ton $30.00
Barytes—Sulph. Am. prime white17.00
Sulph., foreign, floated, p. ton....20.00
Sulph., off color, p. ton 13.00
Carb., lump, f.o.b. L'pool, ton....£6 5 0
No. 1, casks, Runcorn " "£4 10 0
No 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb..... .. 1·60
Borax—℔ lb 9¼
Refined at Liverpool, ℔ ton. £26
Brimstone—*See Sulphur.*
Bromine—℔ lb..... .... 37@38
Chalk—℔ ton.. .... 3.25
Precipitated, ℔ lb. ..... 4¾@5
China Clay—English, ℔ ton13.50@18.50
Southern, ℔ ton..... ..... 13.50
Chrome Yellow—℔ lb .... 10@25
Cobalt—Oxide, ℔ lb..... ..2·60@2·90
Copper—Sulph. English Wks.,ton.....£26
Precip., Eng. Wks, unit. ..fluctuating
Copperas—Common, ℔ 100 lbs..52@57½
Best, ℔ 100 lbs..... .. ....75@1.00
Liverpool, ℔ ton, in casks .....£1 15s.
Cream of Tartar—Am. 99%....24@24¾
Powdered, 99 p c..... .. .. 24¾@25½
Emery—Grain, ℔ lb... .... 4½@5
Flour, ℔ lb .... 2¾@3½
Feldspar—Ground, ℔ ton..... ..15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb.. ....1¾@2
Gypsum—Calcined, ℔ bbl. 1.25
Iodine—Resublimed..... 3.50
Kainit—℔ ton..... .... 9.75@10.50
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. .... 6¾@7
White, American, in oil, ℔ lb... 6¾@7¼
White, English, ℔ lb ... .8½@8¾
Acetate, or sugar of..... 12@13
Lime Acetate—Amer. Brown. .95@1.00
" Gray1.75@1.87½
Litharge—Powdered, ℔ lb. .... .6½@6¾
English flake, ℔ lb..... .. ..9@9½
Magnesite—Greek, ℔ ton.. .... 10.00
Manganese—Crude, per unit ....23@.28
Oxide, ground, per lb..... 2½@6½
Mercuric-Chloride — (*Corrosive Sublimate*) ℔ lb. .... 60@62
Mineral Wool —℔ lb..... 2
Mica—In sheets according to size,
1st quality, ℔ lb..... 25@$6 00
Phosphate Rock—S. Carolina,
per ton . o. b Charleston. 5.00@6.00
Ground, ex vessel New York.10.00@10.50
Canadian Apatite, lump, f. o. b. at
Montreal. ℔ ton 16.00
Phosphorus—℔ lb..... .. .... 7@75
Plumbago—Ceylon, ℔ lb.. .... 4@5
American, ℔ lb..... ..... 5@7
Potassium—Cyanide, ℔ lb.... .39@40
Bromide, ℔ lb..... 33
Chlorate, ℔ lb. .... 13¾@15½
Carb. ℔ lb. ....4.70@5.50
Caustic, ℔ lb .... 7½@8
Iodide... ....2.70@2.75
Muriate, ℔ 100 lbs.... ..... 1.82½@1.90
Nitrate, refined, ℔ lb..... .. 6@8
Bichromate, ℔ lb .... 11½@12
Sulphate, ℔ 100 lbs. 2 40
Yellow Prussiate, ℔ lb.... .... 17½@18
Red Prussiate, ℔ lb... ..... 42@45
Pumice Stone—Select lumps, lb. 3¼@7
Original cks., ℔ lb..... ..... 1¾
Powdered, pure, ℔ lb.. .... .. 2¼@2½
Pyrites—Non-cupreous, p. unit, s. 5d.
Quartz—Ground, ℔ ton. 16.00
Rotten Stone—Powdered, ℔ lb..3¼@3¼
Lump, ℔ lb... .... 6@10
Eng., powdered, ℔ ton. £4
Lump, ℔ ton..... ..... £5
Salt—Liverpool, ground ℔ sack.. 80@85
Turk's Island, ℔ bush ..... 25@27
Salt Cake—℔ lb..... .....50@57
Saltpeter—Crude, ℔ lb. .... 5@5½
Refined, ℔ lb. .... 6@8
Soda Ash—Carb.,48 % 100 ℔...1.22½@1.30
High test .... 1.12½@1.15
Caustic, 48 % ..... 1.23¾@1.30
Soda Caustic, 60%..... 2 40
" " 70%..... 2.15 @2.20
" " 74-6%..... 2.15 @2.20
Sal, English, ℔ 100 lbs.... .90 @1.00
Sal, American, ℔ 100 lbs .... .85
Nitrate, ℔ 100 lbs..... .... 2.15
Strontium—Nitrate ℔ lb. ..... 9@9½
Sulphur—Roll, ℔ lb..... .... 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton.20.00@21.00
Crude Brimstone, 3ds, ℔ ton.19.00@19.50
Talc—Ground French, ℔ lb .. ...1¼@1½
Domestic, ℔ lb ..... 1@1¼
c. i. f. Liverpool, ℔ ton..... .. £4 5 0
Vermillion—American, ℔ lb.. .. 61
English, ℔ lb.. .... 82@85
Vitriol—(blue), Ordinary, ℔ lb..6 @6½
Extra, ℔ lb. 7
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb..... .....6@6½
Paris, Red Seal, ℔ lb. ....6½@7
* Spot

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 ..... 3.25@3.75
Jerseys, ℔ 1,000.. ..... 6.75@7.50
Up Rivers, ℔ 1000 .... 7.50@7.75
Haverstraw seconds, ℔ 1000... 8.00
Haverstraw firsts ℔ 1,000. .. 8.00@8.50
Fronts, nominal, ℔ 1000.
Croton..... ..... 14.00@16.00
Wilmington..... ..... 20.00@21.00
Philadelphia..... ... ... @28.00
Trenton ..... @28.00
Baltimore ....
Building Stone—Amherst
freestone, ℔ cu. ft... ..... 95@1.00
Brownstone, ℔ cu. ft. ..... 1.00@1.35
Granite, rough. ℔ cu.ft..... . 45@1.25
Granite, Scotch ℔ cu. ft.. .. 1.00@1.15
Cement—Rosendale, ℔ bbl .90@1.10
Portland, American, ℔ bbl... 2 15@2.45
Portland, foreign, ℔ bbl.. .. 2.40
Portland, " special brands.?.45@3.75
Roman, ℔ bbl. .... 2.65@2.85
Keene's coarse, ℔ bbl..... .. 4.50@5.50
Keene's fine, ℔ bbl..... .. .. 7.00@8.25
Slate—Purple and green roofing, ℔ 100 ft .... 7.00@7.50
Red roofing, ℔ 100 sq. ft... .10.00@15.00
Black, roofing, ℔ 100 sq. ft... 4.50@5.25
Lime—Rockland, common ℔ bbl... 1 00
Rockland, finishing, ℔ bbl... ..... 1.20
St. John, com. and finish, ℔ bb'. .... .90
Glens Falls, com. and fin., ℔ bbl .80@1.10
Labor—Ordinary, ℔ day..... 1.50@2.00
Masons, ℔ day..... ..... 4.00
Plasterers, ℔ day..... .... 4.00
Carpenters, ℔ day..... ... ... 3.50
Plumbers, ℔ day... .... 3.50
Painters, ℔ day..... ..... 2.50@3.50
Stonesetters, ℔ day..... ... .3.50@4 00
Tilelayers, ℔ day..... ..... 3.50@4.50
Bricklayers, ℔ day..... ..... 4 00

THE RARER METALS.

Aluminum—(Metallic), per lb...$8.50
Arsenic—Metallic, per lb..... 20
Barium—(Metallic), per lb..... 975.00
Bismuth—(Metallic), per lb..... 2.40
Cadmium—(Metallic), per lb.... 1.25
Calcium—(Metallic), per oz..... 150.00
Cerium—(Metallic) per oz..... 160.00
Chromium—(Metallic), per lb...200 00
Cobalt—(Metallic), per lb..... 6.00
Didymium—(Metallic), per oz...160.00
Erbium—(Metallic), per oz.... .140.00
Gallium—(Metallic), per oz 3250.00
Glucinum—(Metallic) per oz .. 250.00
Indium—(Metallic), per oz..... 158.00
Iridium—(Metallic), per lb... .. 650.00
Lanthanum—(Metallic), per oz.175.00
Lithium—(Metallic), per oz.....160.00
Magnesium—Per lb.... .... 4.50
Manganese—Metallic, per lb... 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per oz 6.00
Niobium—(Metallic), per oz.....128.00
Osmium—(Metallic), per lb 640.00
Palladium—(Metallic), per lb...400.00
Platinum—(Metallic), per lb. ..140.00
Potassium—Metallic, per lb.... 28.00
Rhodium—(Metallic), per lb....512.00
Ruthenium—(Metallic), per oz.112.00
Rubidium—(Metallic), per oz...200.00
Selenium—(Metallic), per oz.. .. 3.00
Sodium—(Metallic) per lb. 2.75
Strontium—(Metallic), per oz...128.00
Tantallum—(Metallic) per oz...144.00
Telurium—(Metallic) per oz.... 9.00
Thallium—(Metallic) per oz..... 3.00
Titanium—(Metallic) per oz....32.00
Thorium—(Metallic) per oz..... 272.00
Tungsten—(Metallic) per oz..... 1.25
Vanadium—(Metallic), per oz..320.00
Yttrium—(Metallic), per oz 144.00
Zirconium—(Metallic), per oz..240.00

METALS.

Aluminum—
Bronze (10 %), ℔ lb..... 46c.
Copper—
Lake Ingot, Spot, ℔ lb.... .... 14½c.
Electrolytic, ℔ lb .... 12½c.
Casting Brands, ℔ lb. ....
Chili Bars, London, ℔ ton £38
Sheet Copper (according to size), ℔ lb..... ..... 25@30c.
G. M. B..... 38c.
Nickel.—
Metallic, per lb..... 60c.
Lead—
Domestic, Common, Spot.... 3·65c.
Foreign..... 4·75c.
Sheet, ℔ lb.... .... 6¾c.
Pipe, ℔ lb .... 6c.
Tin lined Pipe, ℔ lb..... 15c.
Shot, ℔ 25-lb. bag ..... 1·20c.
Spanish Lead, London.. ....£12 12s. 6d.
Tin—
Tin Plates .... 13s. 6d.
Tin Spot in London . ... £91 10s.
Pig tin, spot in N. Y., ℔ lb.. 20⅝c.
Zinc—
Domestic spelter, ℔ lb.... .. 4·65c.
Foreign spelter, ℔ lb... ... 5·80c.
Silesian, ton..... .... £17 10s
Sheet, American, ℔ lb .. .... 6¾c.
Antimony—Hallet's, per lb.... 12½c.
Cookson's, per lb..... .. .... 14c.
Star Antimony..... ... £47
Quicksilver—Per lb..... .. 56@58c.
London, ℔ flask.... £8

(By Cable.) April 11.
Rio Tinto .... †£11 13-16 £11⅝
* France. †Closing

IRON AND STEEL.
New York Prices.

American Pig-Iron.—At tidewater.
No. 1 X..... .....$17.50@$18.00
No. 2 X..... .. .... 16.00@ 17.00
Forge . .. . 15.50@ 16.00
Scotch Pig—Coltness... $20.50@ .....
Clyde ..... 19.75@$20.00
Dalmellington..... 19.25@ 19.50
Summerlee..... .....
Shotts..... 20.50@ 21.00
Langloan ..... 20.00@ .....
By Cable to-day to the Metal Exchange :
Scotch Warrants..... .....43s. 7d.
Coltness, at Glasgow..... .....55s.
Langloan, at Glasgow..... .....54s.
Summerlee, at Glasgow..... .....54s.
Gartsherrie, at Glasgow.... .....51s. 3d.
Glengarnock, at Ardrossan..... 51s.
Dalmellington, at Ardrossan.....45s. 6d.
Eglinton, at Ardrossan ... .44s. 9d.
Bessemer Pig—
Foreign, nominally..... .....
Domestic " ..... 15 50@ 16.50
Spiegeleisen—
German, 20 per cent..... .....
English, 20 " " ..... 28.00@ 28.50
" 30 " " ..... 33 00@ 34.00
Ferro Manganese, 80%.... 57.00@ 57.50
Steel Billets, " 30.00@ 33.00
Steel Nail Slabs, " 28.00@ 28.50
Steel Wire Rods, " 41.00@ 41.25
Steel Rails—
Heavy sections, at mill.... 28.00@ 28.00
Light " " ..... 30.00@ 32.00
Structural Iron and Steel—
Bridge Plate, at mill.. .....2·00@2·1c.
Angles, at mill ..... 1·90@2·00c.
Tees, at mill..... .. .... 2 40@2·60c.
Steel Angles, at mill.... ....2¼ @2½c.
Beams and Channels, on wharf, 2·8c. base
Steel Plates—
Tank and Ship, on wharf..... 2⅜@2½
Shell, on wharf..... .... 2¾@3
Flange, " ..... 3 @3¼
Fire-Box, on wharf..... 3¾@4½
Iron Plates—
Common tank, on wharf....2·0@2·2c.
Refined, on wharf..... 2·3@2·4c.
Shell, " ..... 2¼@2·4c.
Flange. " ..... 3·4@3·5c.
Extra flange..... 3¾@4
Bar Iron—
Refined..... .... 1·8@2·0c.
Common ....1·65@1·75c.
Merchant Steel—
American tool .... 7½@10c.
Special grades..... 13 @20c.
Crucible machinery..... 5 @6c
" spring..... .... 4 @4½c.
Bessemer machinery..... 2·0@2·75c.
" spring. . ..... 2·7@2·9c.
Cast-Iron Pipe—At works:
According to size..... $25.00@$31.00
Wrought-Iron Pipe—nominal—
Butt-Welded, Plain and Tarred, 55% disc; Galv., 45% disc.
Lap-Welded, Plain and Tarred, 65% disc.; Galv., 55% disc.
Boiler Tubes—Per cent disc.....62½%
Rail Fastenings—
Spikes..... .. .... 2·1@2·15c. delv'd
Angle Fish-bars..... .1.85@2c.
Bolts and Sq Nuts.....2·9 @3c.
" Hex. .....3·1 @
Wrought Scrap—
No. 1 Yard *to vessel*..... 20.50@ 21.50
Cast Scrap .... 15.50@ 16.50
Old Car Wheels..... ... 17.00@ 18.00
Old Rails—Tees .... 23.00@ 23.50
" —Doubles ....@ 25.00
Nails—In car-load lots. .. $1.80@ $2.00
From store . .... 1.85@ 2.00
Nails .... $1.90 usual discount
Steel Nails..... .... $1.90
Wire Nails..... ..... 2.55
Two per cent off for cash. * At works.

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1..... ....$15.00@$15.50
" " No. 2..... 14 25@ 14.75
" " No. 3..... 13 25@ 13.75
Mahoning Valley (Lake Ore Mixture) ..... 18.00@ 19.00
So. Charcoal, No. 1..... 17.25@ 17.75
" " No. 2..... 16.25@ 16.75
Missouri Charcoal No. 1.... 18.00@ 18.50
" " No. 2.... 17.75@ 18.00
Forge Irons—
Neutral Coke..... ..... $13.25@$13.75
Cold Short ..... 13.00@ 13.50
Mottled..... 12.25@ 12.50
Car Wheel and Malleable Irons—
Southern (standard brands).$21.50@$22.00
" (other brands)..... 17.50@ 18.00
Lake Superior..... 22.00@ 22.50

Pittsburg Prices.

Coke or Bituminous Pig—
Foundry No. 1..... .....$16.50@ .....
Foundry No. 2..... .... 15.50@.....
Gray Forge No. 3..... .... 14.25@14.50
" " No. 4.. .... 14.00@14.25
White .... 14.00@ .....
Mottled..... .... 14.00@.....
Silvery .... 16.00@18.50
Bessemer..... .... 16.25@16.50
Low Phos..... .... 21.00@.....
Charcoal Pig—
Foundry No. 1. .... 23.50@24.50
Foundry No. 2..... .. 22.00@23.50
Cold-Blast..... .... 25.00@28.00
Warm-Blast..... .... 24 00@25.00
10 + 12% Spiegel..... ... 27.50
20% Spiegel..... ... 31.00
Muck-Bar..... .... 26.75@27.00
Steel Blooms..... .... 19.00@19.50
Steel Slabs .... 27.00@27.50
Steel Crop Ends..... .... 18.50@18.75
Steel Bloom Ends..... .... 18.00@18.25
Ferro Manganese, 80%.. .. 59.00@59.50
Steel Billets..... .... 27.50@28.00
Old Iron Rails..... .. 22.75@23.00
Old Steel Rails..... .... 17.50@18.00
No. 1 W. Scrap..... .... 19.00@19.50
No. 2 W. Scrap . ... 18.00@.....
Steel Rails..... .... 28.00@.....
" light sections... ..... 28.00@31.00
Bar Iron., nominal..... 1.75@ 1.80
Iron Nails..... 1.90
Steel Nails..... 1.90
Wire Nails..... 2.25

Philadelphia Prices.

Foundry No. 1..... $17.50@18.00
Foundry No. 2. ..... 16.50@17.00
Gray Forge..... 15.50@15.25
Bessemer Pig..... 20.00@ .....
Steel Rail Blooms..... 29.50 nom
Foreign Bessemer..... 20.00@.....
Spiegeleisen. ....@28.00
Scrap, Selected..... 22.00@22.50
No. 1..... ..... 21.00@22.00
Cargo Scrap..... .... 20.00@21.00
Muck-Bars..... .....@27.50
Merchant Iron..... .... 1.60@ 1.80
Plate Iron..... .... 1.90@ 2.00
Tank Iron ..... 2.00@ 2.10
Skelp Iron..... ..... 1.70@ 1.85
Angles..... ..... 2.00@.....
Beams and Channels..... .... 2.80@.....
Nails..... .... 1.60@ 1.90
Steel Rails..... 27.00@28.00
Old Rails..... 23.50@24.00

STOCK MARKET QUOTATIONS.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. R. Mill Co.	....	$60
Ala. Con. C. & C. Co.....	$24@$26	....
*Alice Furnace.	$101@$102	....
Bess. Land Co.	$2¾‡	‡$2¾‡
Bir. Fur. & Mg.	$17½	$17¼@$25
Bir. Mg.& Mfg.	$100	$145@$150
Broken Arrow.	$2¼	$6
Decat. L. Imp.	....	‡$10¼
DecaturMin.L.	$20@$21	$24@$25
Enterprise Mfg.	....	$50
*Eureka	$101@$103	$107@$108
Hen. S. & M.Co.	$110‡	$115‡
Jagger Towley C. & C.....	....	$11@$11½
Mag-Ellen.....	$96	$100¼
*Mary Pratt...	$100	....
†Sloss I. & S....	$94	$95
††Sloss I. & S..	$67@$67½	....
Tenn.C. & I. Co.	$37	....
*Williamson...	$99¾	....
Woodstock I. Co.	$54¼@$55	$60

Sales during the week ended April 23d.

Bessemer L. Co.....290 shs.		$23¼@$24¾
Decatur L. Imp. ... 25 shs.		$10¼
Henderson S. & M.C. 5 shs.		$110@$115

* Bonds. † First mortgage, †† Second mortgage. ‡ Selling price.

Pittsburg, Pa.

COMPANY.	H.	L.	Closing
Allegheny Gas Co.	36.00	36.00	36.00
Bridgewater GasCo	51.00	40.00	51.00
Chartiers Val. Gas.	55.00	53.50	54.00
Consignee Mg. Co.	.21	.20	.20
La Noria Mining ..	1.88	1.63	1.75
Nat. Gas Co. of W. Va	62.00	59.00	62.00
Ohio Valley Gas...	35.00	35.00	35.00
Pennsylvania Gas..	22.00	16.50	22.00
People's N. G. & P. Co.....	18.00	16.50	18.00
Philadelphia Co...	43.00	41.50	42.00
Pine Run Gas... .	90.00	85.00	85.00
Pittsburg Gas.....	62.50	62.00	62.50
Silverton Mg. Co..	1.00	1.00	1.00
South Side Gas.. ..	26.00	26.00	26.00
Tuna Oil Co.....	68 00	65.00	65.00
Washington Oil Co.	75.50	75. 0	75.00
Wh'ouse A. B. Co..	120.00	119.38	119.00
Wh'ouse B. Co. Lm.	64.00	64.00	64.00
Wh'ouse E. Light.	61.00	58.00	60.00
Wheeling Gas	32.50	30.50	32.00

Sales during the week ending April 25:

Chartiers Val.Gas,	210 shs.	$54@$54⅝
La Noria Mg. Co..	800 "	1¾@ 1⅞
Philadelphia Co..1,040	"	42@ 43
Wh'ouse A. B. Co.	115 "	119⅛@119¾
Wheeling Gas.....	645 "	30¾@ 32

Foreign Quotations.

COMPANY.	*London.* Highest.	April 13. Lowest.
Alturas Gold, Idaho...	4s.	3s.
Arizona Copper, Ariz..	18s. 6d.	18s.
Callao Bis , Venz.....	5s.	4s.
Carlisle, N. Mex	5s.	4s.
Colorado United, Colo..	4s.	3s.
Columbian, S. A.....	£2	£1¾
Comstock, Utah... ..	£1¼	£1⅛
Cons. Esmeralda, Nev..	6s. 6d.	5s. 6d.
Denver Gold, Colo....	1s. 6d.	1s.
Dickens Custer, Idaho.	2s. 6d.	1s. 6d.
Eberhardt, Nev.	1s. 6d.	1s.
El Callao, Venezuela....	£2¼	£2
Empire, Mont	5s.	2s. 6d.
Flagstaff, Utah.....	1s. 6d.	1s.
Garfield, Nev.....	8s.	6s.
Ilex, Cal.....	£⅜	£⅛
Josephine, Cal	10s.	8s.
Kohinoor, Colo.....	4s.	3s.
Mason & Barry, Port...	£6¼	£6¼
Montana Lt., Mont	£2 1-16	£1 15-16
New California, Colo...	7s. 6d.	7s.
New Consolidated.....	1s. 6d.	1s.
New Emma, S., Utah...	5s. 6d.	4s. 6d.
New Hoover Hill.....	2s. 6d.	2s.
New La Plata, Colo...	2s. 6d.	1s. 6d.
North Mexican, Mex....	8s.	7s. 6d.
Old Lout, Colo.....	£1⅛	£⅜
Pittsburg Cons., Nev...	16s. 3d.	13s. 9d.
Quebrada, Venezuela...	£1⅛	£⅜
Richmond Con., Nev...	£2	£1¼
Ruby&Dunderberg,Nev	1s. 9d.	1s. 3d.
Russell Gold, N. C.....	3s.	2s.
Sierra Buttes, Cal.....	£13-16	£11-16
Stanly, N. C	4s.	2s.
United Mexican, Mex...	£3¼	£3
U. S. Placer, Colo.....	3s. 6d.	2s. 6d
Viola Lt., Idaho	5s.	4s.
	*Paris.**	April 11.
Boleo, Mex	440.00	440.00
East Oregon, Ore.....	45.00	45 00
El Callao, Venezuela..	51.00	51.00
Forest Hill Divide, Cal.	390.00	390.00
Golden River, Cal	390.00	390.00
" " parts.. .	60.00	60.00
Lexington, Mont. ....,.	115.00	115.00
" parts..... .	4.50	4.50
Tharsis, Spain,. ...	106.25	106.25

DIVIDEND-PAYING MINES

	Name and Location of Company.	Capital Stock	Shares No.	Shares Par	Assessments. Total levied	Assessments. Date and amount of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	$555,000	Jan. 1887 .15
2	Alice, s. c	Mont	10,000,000	400,000	25	*	775,000	Dec. 1888 .06¼
3	Alma Cons., g. s.	Idah.	300,000	30,000	10	*	45,000	Dec. 1884 .50
4	Alturas, g	Idah.	1,500,000	300,000	5	*	262,500	Jan. 1888 .37½
5	Amy & Silversmith, s.	Mon.		341,419			247,530	Aug. 1887 12½
6	Atlantic, c.	Mich	1,000,000	40,000	25	$230,000	520,000	Apl. 1875 $1.00
7	Argenta, s	Nev.	10,000,000	100,000	100	325,000	40,000	July 188 .10
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*	240,000	Feb. 1889 .20
9	Aurora, l.	Mich	2,000,000	100,000	20		156,000	Oct. 1887 1.87½
10	Bassick, G.	Colo.	10,000,000	100,000	100	*	400,000	Mar. 1884 1.00
11	Belle Isle, s.	Nev.	10,000,000	100,000	100	145,000	300,00	Dec. 1887 .95
12	Belcher, g. s.	Nev.	10,400,000	104,000	100	2,822,000	15,397,200	Apl. 1876 1.00
13	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	76,250	187,500	Jan. 1887 10
14	Bodie Con., g. s.	Cal.	10,000,000	100,000	100	550,000	1,295,000	Apl. 1885 .50
15	Boston & Mont., g.	Mon.	2,500,000	250,000	10	*	620,000	Jun. 1880 .10
16	Boston & Mont., c.s.	Mon	2,500,000	250,000	10	*	500,000	Apl. 1889 1.00
17	Bresee, s.	Colo	000,000	200,000	25	*	2,000	Feb. 1880 .01
18	Brooklyn Lead, L. S.	Utah	500,000	50,000	10		127,000	July 1887 .05
19	Bulwer, g.	Cal.	10,000,000	100,000	10	105,000	175,000	Jan. 1884 .10
20	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*	150,000	Oct. 1883 .06¾
21	Caledonia, g.	Dak.	10,000,000	100,000	100	505,000	88,000	Apl. 1889 .08
22	Calumet & Hecla, c.	Mich	2,500,000	100,000	25	1,200,000	31,850,000	Feb. 1889 5.00
23	Carbonate Hill, s. L.	Colo.	1,500,000	300,000	5	*	80,000	Apl. 1884 .05
24	Carlisle, g. s.	N. M.	1,000,000	200,000	5		175,000	Dec. 1888 .12½
25	Castle Creek, g.	Idah.	100,000	100,000	1		51,000	Oct. 1883 .03
26	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*	270,000	May 1884 .10
27	Central, c.	Mich	500,000	20,000	25	100,000	1,930,000	Feb. 1889 2.00
28	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	1,650,000	Dec. 1884 .25
29	Colorado Central, s. l.	Colo.	2,750,000	275,000	10	*	384,750	Feb. 1889 .05
30	Confidence, s. L.	Nev.		24,000		287,440	199,680	Apl. 1887 .50
31	Cons. Cal. & Va., g. s.	Nev.	21 600 000	216,000	100	108,000	2,764,800	Apl. 1889 .50
32	Contention, s.	Ariz.	12,500,000	250,000	50		12,587,000	Dec. 1884 .25
33	Cop. Queen Cons, c.	Ariz.	1,400 000	140,000	10		140,000	Oct. 1888 .50
34	Crescent, s. L. g.	Utah	15,000,000	600,000	25	*	228,000	Oct. 1888 .03
35	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,825,000	11,588 000	Jan. 1875 2.00
36	Daly, s. L.	Utah	3,000,000	150,000	20	*	1,012,500	Apr. 1889 .35
37	Deer Creek, s.	Idah.	1,000,000	200,000	5	*	10,000	Oct. 1888 .05
38	Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*	41,000,000	Nov. 1887 .10
39	Derbec B. Grav., g. s.	Cal.	10,000,000	100,000	100	90,000	180,000	May 1887 .10
40	Dunkin, s. L.	Colo.	5,000,000	200 000	25	*	370,000	Apl. 1889 .05
41	Dunstone, g. s. L.	Mont	1,000,000	200,000	5	*	6,000	Nov 1888 .03
42	Eclipse	Colo.	100,000	100,000	1		20,000	Nov. 1887 .10
43	Elknorn, g. s.	Mont	1,000,000	100,000	10	50,000	170,000	July 1887 .05
44	Empire L., g. s.	Mont	500,000	50,000	5		70,500	Oct. 1887 .37½
45	Eureka Con., g. s. L.	Nev.	5,000,000	50,000	100	625,000	4,955,000	July 1888 .25
46	Evening Star, s. L.	Colo.	500,000	50,000	10	*	1,425,000	Apl. 1889 .25
47	Excelsior, g.	Cal.	10,000,000	100,000	100	560,000	875,000	Oct. 1880 .25
48	Father de Smet, g.	Dak.	10,000,000	100 000	100	200,000	1,125,000	Dec. 1885 .20
49	Franklin, c.	Mich	1,000,000	40,000	25	220,000	800,000	Dec. 1888 2.00
50	Freeland, g. s. c.	Colo.	5,000,000	200,000	25	*	190,000	July 1888 .10
51	Fresno Enterprise, g.	Cal.	500,000	100,000	50		110,000	July 1882 .10
52	Garfield Lt., g. s.	Nev.	500,000	100,000	5	Mch 1883 .10	35,000	Apl. 1888 12½
53	Golconda, g. s.	Idah.	1,000,000	100,000	10		120,000	May 1888 .60
54	Gould & Curry, g. s.	Nev.	10,800,000	108,000	100	4,369,800	928,800	Oct. 1870 10.00
55	Grand Central, s.	Ariz.	1,000,000	100,000	10	Jnn. 1889 .30	625,000	Dec. 1882 .25
56	Grand Prize, s.	Nev.	10,000,000	100,000	100	625,000	497 000	Mar. 1884 .25
57	Granite, s. L.	Idah.	500,000	500,000	25	Mar. 1889 30	10,000	Jun. 1888 .02
58	Granite Mountain, s.	Mont	10,000,000	400,000	25		5,800,000	Apl. 1889 .50
59	Green Mountain, g.	Cal.	1,250,000	125,000	10		212,000	Nov. 1881 .07½
60	Hale & Norcross, g. s	Nev.	11,200,000	112,000	100	5,086,000	1,822,000	Aug. 1888 .50
61	Hecla Con., g. s. L. c.	Mont	1,500,000	30,000	50		1,272,500	Jan. 1889 .50
62	Hel'a Mg & Red, g.s.l.	Mont	3,315,000	663,000	5		197,973	July 1886 .06
63	Holmes, s.	Nev.	10,000,000	100,000	100	300,000	75,000	Apl 1886 .25
64	Holyoke, g.	Idah.	200,000	200,000	1		27,000	Feb. 1889 .10
65	Homestake, g.	Dak.	12,500,000	125,000	100	900,000	4,381,250	Apr. 1889 .10
66	Honorine, s. L.	Utah	500,000	250,000	2	37,500	125,000	Sept 1887 .05
67	Hope, s.	Mont	1,000,000	100,000	10	*	233,252	Apl. 1888 .25
68	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*	4,000,000	Nov. 1884 .50
69	Hubert, g.	Colo.	500,000	50,000	10		239,500	Oct. 1888 .11
70	Idaho, g.	Cal.	310,000	3,100	100		5,135,150	Apl. 1889 5.00
71	Ideal, s. L.	Colo.	1,500,000	50,000	10		15,000	Oct. 1885 .10
72	Illinois, g.	N. M.	100,000	100,000	1	*	45,000	Apl. 1889 .20
73	Independence, s.	Nev.	10,000,000	100,000	100	340,000	225,000	Sept 1879 .25
74	Iron Hill, s.	Dak.	2,500,000	250,000	10	126,500	156,250	Nov 1887 .07½
75	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20		2,500,000	Apl. 1889 .20
76	Jackson, g. s.	Nev.	5,000,000	50,000	100	237,500	50,000	Oct. 1886 .10
77	Jay Gould	Mont	2,000,000	40,000	5	Nov 1880 .40	321,000	Dec. 1888 .02½
78	Joculatita, s.	Mex.	2,500,000	250,000	10		1,200,000	Feb. 1889 .50
79	Jumbo, g.	Colo.	2,000,000	200,000	10		35,000	Oct. 1887 .02½
80	Kentuck	Nev.	3,000,000	30,000	100	342,000	1,350,000	Dec. 1886 .10
81	La Plata, s. L.	Colo	2,000,000	200,000	10	*	610,000	Sept 1882 .30
82	Leadville Cons., s. L.	Colo.	4,000,000	400,000	10	*	423,000	Apl. 1887 .05
83	Lexington, g. s.	Mont	4,000,000	40,000	100	*	565,000	Jan. 1885 2.00
84	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*	800,000	July 1888 .10
85	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	1,050,000	Mch. 1889 .50
86	Marion Bullion, g	N.C.	500,000				15,000	Jan. 1886
87	Martin White, s.	Nev.	10,000,00	100,000	100	1,175,000	140,000	Dec. 1886 .25
88	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*	175,000	May 1888 5.00
89	Minnesota, c	Mich	1,000,000	40,000	25	420,000	1,826,000	Mar. 1876
90	Mono, g.	Cal.	5,000,000	50,000	100	65,350	12,500	Mar. 1886 .25
91	Montana, Lt., g. s.	Mont	3,300,000	660,000	5	*	2,100,285	Jan. 1889 .06¼
92	Morning Star, s. L.	Mont	1,000,000	100,000	10		775,000	Mar. 1888 .25
93	Moulton, s. g.	Mont	2,000,000	400,000	5	*	380,000	Dec. 1887 .07½
94	Mount Pleasant, g.	Cal.	150,000	150,000	1	*	150,000	Feb. 1887 .30
95	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	140,000	Jan. 1880 2.00
96	Napa, g	Cal.	700,000	100,000	7		290,000	Jan. 1883 .10
97	Navajo, g. s.	Nev.	10,000,000	100,000	100	485,000	365,000	Apl. 1889 .10
98	New Guston, s.	Colo.	500,000	100,000	5		100,000	Dec. 1888 .50
99	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½		30,000	Dec. 1883 .06¼
100	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	2,400,000	Apl. 1883 .50
101	North Belle Isle, s.	Nev.	10,000,000	100,000	100	350,000	230,000	May 1888 .50
102	North Star, g.	Cal.	1,000,000	100,000	10		150,000	Dec. 1888 .50
103	Ontario, s. L.	Utah	15,000,000	150,000	100		10,025,000	Apr 1889 .50
104	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,109,440	1,995,800	July 1882 1.00
105	Original, s. c.	Mont	1,500,000	60,000	25	*	123,000	July 1883 .05
106	Osceola, c.	Mich	1,250,000	50,000	25	480,000	1,322,500	Mar. 1887 1.60
107	Oxford, s.	Colo.	125,000	125,000	1		18,500	Oct. 1885 .02
108	Paradise Valley, g. s	Nev.	10,000,000	100,000	100	57,000	150,000	Apl. 1887 .10
109	Parrott, c.	Mont	1,800,000	180,000	10		354,000	Jan. 1889 .10
110	Peacock, s. g. c.	N.M.	2,000,000	200,000	10	*	60,000	Nov. 1886
111	Plutus, g. s. c. L.	Colo.	2,000,000	200,000	10	*	20,000	Feb. 1886 .10
112	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*	2,280,000	Feb. 1883 .40
113	Quicksilver, preferred	Cal.	4,000,000	45,000	100		1,599,593	May 1888 1.50
114	" " com., q.	Cal.	5,700,000	57,000	100		643,867	July 1882 .40
115	Quincy, c.	Mich	1,000,000	40,000	25	200,000	1,170,000	Feb. 1889 5.00
116	Richmond, s. L.	Nev.	1,350,000	54,000	25	*	4,312,587	Jun. 1887 1.25
117	Ridge, c.	Mich.	500,000	20,000	25	219,939	99,785	Feb. 1880 .50
118	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*	585,000	Mar. 1886 .05
119	Robert E. Lee, s. L.	Colo	10,000,000	500,000	20	*	100,000	Dec. 1882 .50
120	Savage, s.	Nev.	11,200,000	112,000	100	6,486,000	4,460,000	July 1889 3.00
121	Shoshone, g.	Idah.	150,000	150,000	1		7,500	Apl. 1883 .01
122	Sierra Buttes, g.	Cal.	2,225 000	122,500	10		1,568,145	Apl. 1888 .12½
123	Sierra Nevada, g. s.	Nev.	10,000,000	100,000	100	6,175,000	102,000	Jan. 1871 1.00
124	Sierra Nevada, s. L.	Idaho	1,000,000	1	1		20,000	June 1888 .01
125	Silver Cord, g. s. L.	Colo.	5,000,000	500,000	10		275,000	Apl. 1889 .10
126	Silver King, s.	Ariz.	10,000,000	100,000	100	50,000	1,950,000	July 1887 .25
127	Silver Mg. of L.	N. M.	500,000	500,000	1		25,000	June 1888 .05
128	Silverton, g. s. L.	Colo.	2,000,000	200,000	10	*	80,000	Nov. 1886 .02
129	Small Hopes Cons., s.	Colo.	5,000,000	250,000	20	*	3,112,500	Dec. 1887 .20
130	Smuggler, s. L.	Colo.	600,000	60,000	10		66,700	Aug. 1883 .25
131	Spring Valley, g.	Cal.	200,000	200,000	1	50,000	50,000	Jan 1881 .25
132	Standard, g. s.	Cal.	10 000,000	100,000	100	25,000	3,595,000	Jun. 1888 .05
133	Stormont, s	Utah	500,000	500,000	1	*	155,000	Nov 1881 .05
134	St. Joseph, L.	Mo.	1,500,000	150,000	10	*	844,000	Dec 1887 .20
135	Surinam, g.	D. G.	3,000,000	600,000	5	*	105,000	Nov. 1887 .05
136	Swansea, g.	Colo.	600,000	60,000	10	*	9,000	Apl. 1888 .02½
137	Syndicate, g.	Cal.	10,000,000	100,000	100	38,729	48,308	Sept 1885 .10
138	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000	840,000	Apl. 1889 5.00
139	Tip Top, s	Ariz.	10,000,000	100,000	100	250,000	100,000	Nov 1881 .20
140	Tombstone, g. s. L.	Ariz.	12,500,000	500,000	25	*	1,250,000	Apl. 1882 .10
141	United Verde, c.	Ariz.	3,000,000	300,000	10	*	97,500	Feb. 1884 .20
142	Valencia, M.	N. M.	150,000	1,500	100	*	37,500	Apl 1886 2.50½
143	Viola Lt. s. L.	Idah.	750,000	150,000	5	*	272,500	Oct. 1888 .07½
144	Ward Cons., s. L.	Colo.	2,000,000	200,000	10		10,000	A pl. 1889 .05
145	Yankee Girl	Colo.	2,500,000	250,000	10		1,275,000	July 1887 .10
146	Yellow Jacket, g. s.	Nev.	12,000000	120,000	100	5,508,000	2,184,000	Mar 1889 .50

NON-DIVIDEND-PAYING MINES

	Name and Location of Company.	Capital Stock.	Shares No.	Shares Par Value.	Assessments. Total levied.	Assessments. Date & am't of last.
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*
2	Allouez, c.	Mich	2,000,000	80,000	25	$697,000 Mar. 1888 .50
3	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	562,500 Nov. 1888 87½
4	Alta, s.	Nev.	10,080,000	100,800	100	2,248,800 Sept 1888 .50
5	Amador, g.	Cal.	400,000	200,000	2	*
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000 Jun 1877 .5
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5	*
8	Appalachian, Lt., g.	N. C.	1,500,000	300,000	5	*
9	Astoria, g.	Cal.	200,000	100,000	2	*
10	Barcelona, g.	Nev.	5,000,000	200,000	25	*
11	Bechtel Con., g.	Cal.	10,000,000	100,000	100	173,500 Jan. 1888 .15
12	Belmont, s.	Nev.	5,000,000	50,000	100	735,000 Apl. 1886 .10
13	Best & Belcher, g. s.	Nev.	10,080,000	100,800	100	2,104,990 Jan. 1889 .25
14	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*
15	Bi-Metallic, s.	Mon.	5,000,000	200,000	25	*
16	Black Oak, g.	Cal.	3,000,000	300,000	10	*
17	Boston Con., g. s.	Cal.	10,000,000	100,000	100	170,000 Nov 1883 .25
18	Bremen, s.	N. M	5,000,000	500,000	10	*
19	Brunswick, g.	Cal.	2,000 000	400,000	5	*
20	Bullion, g. s.	Nev.	10,000,000	100,000	100	4,007,000 Aug. 1888 .50
21	Calaveras, g.	Cal.	500,000	500,000	1	*
22	Carisa, g.	Wy	500,000	100,000	5	*
23	Carpenter, g. s. L. c.	Ven.	500,000	50,000	2	*
24	Cashier, g. s.	Colo.	500,000	250,000	2	*
25	Cen. Contin'l, g.s.L.	C.&a	2,000,000	200,000	10	*
26	Charles Dickens, g.s.	Idah.	1,250,000	250,000	5	*
27	Chirokee, g.	Cal.	1,500,000	150,000	10	
28	Chollar, s.	Nev.	11,200,000	112,000	100	1,428,000 Oct. 1888 .50
29	Cleveland, T.	Dak.	1,000,000	500,000	2	*
30	Colchis	N. M.	500,000	50,000	1	
31	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000 Nov 1888 .50
32	Comstock, g. s.	Nev.	10,000,000	100,000	100	30 000 Mar. 1887 .15
33	Con. Imperial, g. s.	Nev.	5,000,000	50,000	100	1,800,000 Nov. 1888 .05
34	Con. Pacific, g.	Cal.	6,000 000	60,000	100	183,000 Fb. 1889 .15
35	Cons. Silver, s.	Mo.	2,500,000	250,000	10	
36	Courtlandt	Colo.	500,000	50,000	10	*
37	Crescent, s. L.	Colo.	3,000,000	300,000	10	*
38	Crocker, s.	Ariz.	10,000,000	100,000	100	115,000 Feb. 1889 .10
39	Crowell, g.	N. C.	500,000	500,000	1	*
40	Dahlonega, g.	Ga.	250,000	250,000	1	*
41	Dandy, s.	Colo.	5,000,000	500,000	10	
42	Dardanelles, g.	Cal.	1,000,000	100,000	10	*
43	Decatur, s.	U.S.C	1,500,000	300,000	5	*
44	Denver City, s. L.	Colo.	5,000,000	500,000	10	*
45	Denver Gold, g.	Colo.	300,000	60,000	5	*
46	Durango, g.	Colo.	500,000	500,000	1	*
47	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000 Mar. 1886 1.00
48	El Cristo, g. s.	U.S.C	1,000,000	500,000	2	*
49	El Dorado, g.	Cal.	1,000,000	250,000	4	*
50	El Talento, g.	U.S.C	1,500,000	500,000	2	*
51	Empire, s.	Utah	10,000,000	100,000	100	*
52	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*
53	Exchequer	Nev	10,000,000	100,000	100	515,000 Apl. 1889 .25
54	Found Treasure, g.s.	Nev.	10,000,000	100,000	100	30,530 Apl. 1889 12½
55	Gogebic L. Syn., l.	Wis.	5,600,000	200,000	25	
56	Gold Cup, s.	Colo.	500,000	500,000	1	*
57	Golden Era, s.	Mon.	2 000,000	200,000	10	*
58	Gold Placer, g.	Colo.	5,000,000	200,000	25	229,314 Dec. 1885 .25
59	Gold Rock, g.	Cal.	1,000,000	500,000	2	*
60	Goodshaw, g.	Cal.	10,000,000	100,000	100	*
61	Grand Belt, c.	Tex.	12,000,000	120,000	100	
62	Grand Duke	Colo.	800,000	80,000	10	*
63	Great Romance, g.	U.S.C	1,000,000	500,000	2	*
64	Gregory-Bobtail, g.	Colo.	550,000	550,000	1	*
65	Gregory Con., g.	Mon.	3,000,000	300,000	10	
66	Hariem M. & M. Co, g.	Cal.	1 000,000	200,000	5	
67	Head Cent. & Tr. s. g	Ariz.	10,000,000	100,000	100	
68	Hector, g.	Cal.	1,500,000	300,000	5	45,000 Jan. 1889 .15
69	Highland, c.	Mich	500,000	25,000	20	*
70	Hollywood	Cal.	200,000	100,000	2	*
71	Hortense, s.	Nev.	2,000,000	200,000	10	
72	Huron, c	Mich	1,000,000	40,000	25	280,000 May 1887 3.00
73	Iron Gold & Silver, s	N. M.	2,000,000	200,000	10	*
74	Ironton, l.	Wis.	1,000,000	40,000	25	*
75	Iroquois, c	Mich	1,250,000	50,000	25	*
76	J. D. Reymert	Ariz.	10,000,000	100,000	100	*
77	Julia Cons., g. s.	Nev.	11,000,000	110,000	100	1,660,000 Jan. 1889 .10
78	Kearsarge, c.	Mich	1,250,000	50,000	25	190,000 Oct. 1887 1.00
79	Lacrosse, g.	Colo.	1,000,000	100,000	10	*
80	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*
81	Mammoth Bar, g.	Cal.	10,000,000	100,000	100	50,000 Dec. 1881
82	May Belle, g.	Cal.	10,000,000	100,000	100	84,000 Mar. 1884 .15
83	Mayflower Gravel.	Cal.	1,000,000	100,000	10	485,000 Jan 1889 .50
84	Mingo, g.	Dak.	250,000	250,000	1	*
85	Mexican, s.	Nev.	10,000,000	100,000	100	2,750,760 Mar. 1889 .25
86	Middle Bar	Cal.	400,000	200,000	2	*
87	Mike & Starr, s. L.	Colo.	1,000,000	200,000	5	*
88	Monitor, g.	Colo.	100,000	100,000	1	*
89	Moose Silver, s.	Colo.	3,000,000	300,000	10	*
90	Mutual Mg. & Sm.	W'sh	10 0,000	100,000	1	*
91	Native, c.	Mich	1,000,000	40,000	25	
92	Neath, g.	Colo.	1,000,000	100,000	10	
93	Nevada Queen, s.	Nev	10,000,000	100,000	100	180,000 Dec. 1888 .50
94	New Germany, g.	N. S.	100,000	100,000	1	*
95	New Pittsburg, s. L.	Colo.	2,000,000	200,000	10	*
96	N. Commonw'h, s.	Nev.	10,000,000	100,00	100	30,000 Oct. 1888 .30
97	North Standard, g.	Cal.	10,000,000	100,000	100	20,000 Nov
98	Oconto	Cal.	600,000	60,000	10	208,000 Dec. 1881 .10
99	Oneida Chief, s.	Colo.	500,000	125,000	100	*
100	Oriental & Miller, s.	Nev.	10,000,000	400,000	25	*
101	Osceola, g.	Nev.	5,000,000	50,000	100	*
102	Overman, g. s.	Nev.	11,520,000	115,200	100	3,765,800 Jan. 1889 .25
103	Park, s.	Utah	2,000,000	200,000	10	
104	Peer, s.	Ariz.	10,000,000	100,000	100	145,000 Jan. 1889 .10
105	Peerless, s.	Ariz.	10,000,000	100,000	100	370,000 Mar 1889 .25
106	Phœnix, g. s.	Ariz.	500,000	500,000	100	*
107	Phœnix, g. s.	Ark.	5,000,000	200,000	250	*
108	Phœnix Lead, s. L.	Colo.	100,000	100,000	1	*
109	Pilgrim, g.	Cal.	600,000	300,000	2	*
110	Potosi, s.	Nev.	11,200,000	112,000	100	1,405,600 Apl. 1889 .50
111	Proustite, s.	Idah	250,000	250,000	1	*
112	Puritan S. G.	Colo.	1,500,000	150,000	10	*
113	Quincy	Mass.	1,000,000	300,000	10	*
114	Rappahannock, g. s.	Va	250,000	250,000	1	*
115	Red Elephant, s.	Colo.	500,000	500,000	1	*
116	Ropes, g. s.	Mich	2,000,000	80,000	25	103,200 July 1887 .50
117	Russell, g	N. C.	1,500,000	300,000	5	
118	Sampson, g. s. L.	Utah	10,000,000	100,000	100	288,157 July 1888 1.00
119	San Sebastian, g.	San S	1,600,000	320,000	5	*
120	Santa Fe, c.	N. M.	5,000,000	500,000	10	*
121	Santiago, c.	U.S.C	400,000	200,000	2	*
122	Security, s.	Colo.	10,000,000	1,000,000	10	*
123	Sheridan	N. M.	2,000,000	200,000	10	*
124	Silver Queen, c.	Ariz.	5,000,000	200,000	25	*
125	South Bulwer, g.	Cal.	10,000,000	100,000	100	100,000 May 1881 .25
126	South Hite	Cal.	10,000,000	100,000	100	195,000 Jan. 1888 .05
127	Stanislaus, c.	Mich	2,000,000	100,000	20	*
128	Stanislaus, g.	Cal.	2,000,000	200,000	10	*
129	State Line, s.	Nev.	250,000	250,000	1	*
130	St. Kevin, g. s.	Colo.	100,000	100,000	1	*
131	St. Louis & Mex., s.	Mex.	5,000,000	500,000	10	*
132	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10	*
133	St. L. & St. Felipe, g. s.	Mex.	1,500,000	150,000	10	*
134	St. L. & Sonora, g. s.	Mex.	1,500,000	150,000	10	*
135	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*
136	Sunday Lake, l.	Mich	1,250,000	50,000	25	*
137	Sullivan Cons.	Dak.	600,000	200,000	3	*
138	Sutter Creek, g.	Cal.	500,000	100,000	5	*
139	Sutro Tunnel	Nev.	20,000,000	2,000,000	10	*
140	Sylvanite, s	Colo.	5,000,000	500,000	10	*
141	Taylor-Plumas, g.	Cal.	1,000,000	200,000	5	10,000 Feb. 1888 .03
142	Tioga Cons., g.	Cal.	10,000,000	100,000	10	295,000 May 1888 .10
143	Tornado Cons., g. s.	Nev.	100 000	100,000	1	*
144	Tortilita, g. s.	Ariz.	1,000,000	100,000	100	*
145	Tuscarora, s.	Nev.	10,000,000	500,000	2	110,00 Oct. 1881 .1
146	Union Con., g. s.	Nev.	10,000,000	100,000	100	3,210,000 Jan. 1889 .25
147	Utah, s.	Nev.	10,000,000	100,000	100	145,000 Mar. 1889 .25
148	Washington, c.	Mich	1,000,000	40,000	25	*
149	West Granite Mt., s.	Mon.	5,000,000	500,000	10	*
150	Zelaya, g. s.	C. A.	600,000	300,000	2	*

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,330,000 in dividends, and the Con Virginia $24 00,000. ¶ Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Que

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES

NAME AND LOCATION OF COMPANY.	April 20.		April 22.		April 23.		April 24.		April 25.		April 26.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Alice, Mont	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Argenta, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Aspen Mg. & S., Colo.	11 00	.....	11.50	11.25	11 25	....	11.00	....	11 00	....	11.00	....	1,175
Belcher, Nev	3 95	....	3 90	....	....	....	....	....	....	....	....	....	200
Belle Isle, Nev.	....	.....	21	....	.20	....	....	....	....	....	....	....	600
Bodie Cons., Cal.	....	.....	....	....	1.30	....	1.40	1.30	.....	....	1.75	....	1,250
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bulwer, Cal	....	.....	....	....	....	....	.30	....	....	....	.40	....	700
Caledonia, Dak	....	.....	....	....	3 05	....	....	....	3.10	....	3.10	....	300
Calumet & Hecla	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Challenge, Nev.	....	.....	2.40	....	....	....	....	....	....	....	....	....	100
Chrysolite, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Colorado Cent'l, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Cons. Cal. & Va., Nev.	9.00	.....	8.63	....	8.25	....	8 63	....	8.38	....	8.50	8.13	780
Crown Point, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Deadwood, Dak.	....	.....	....	....	1.50	....	....	....	....	....	....	....	20
Dunkin, Colo.	.95	.....	....	....	....	....	....	....	....	....	....	....	100
Eureka Cons., Nev	2.00	.....	....	....	1 95	....	2.00	....	....	....	3.00	....	550
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....
Gould & Curry, Nev.	....	.....	2.90	....	....	....	....	....	....	....	....	....	200
Grand Prize, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hale & Norcross, Nev	....	....	4 60	4.50	4.40	....	....	....	....	....	....	....	450
Hollyoke, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak.	....	....	8.00	....	7.5	7.25	7.50	....	7 00	....	7 50	6 50	465
Horn-Silver, Ut.	1.35	.....	1.55	....	1 30	....	1.25	....	....	....	1.30	1.2	930
Iron Hill, Dak.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Iron Silver, Colo.	3 00	.....	3.00	....	....	....	....	....	2.80	2 75	....	....	900
Leadville C., Colo.	....	....	....	....	....	....	....	....	....	....	....	....	1,100
Little Chief, Colo.	....	....	.24	....	....	....	.27	.26	.26	....	....	....	3,000
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal.	....	....	....	....	1.35	....	1.75	1 45	....	....	....	....	1,000
Moulton, Mont.	.22	.20	.26	.24	....	....	.24	....	25	....	.25	....	1,250
Mount Diablo, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
North Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
North Star, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Ut.	....	....	....	....	35 00	34.50	....	....	....	....	....	....	1/4
Ophir, Nev.	7 00	.....	6.00	....	8 63	....	....	....	....	....	....	....	30
Plutus, Colo.	....	.....	1.00	....	1.00	....	1.00	....	....	....	1.0	....	1,700
Plymouth, Cal.	....	.....	....	....	....	....	....	....	....	....	10.50	....	100
Quicksilver Pref., Cal	....	.....	37 75	....	....	....	....	....	....	....	....	....	200
" Com., Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo.	....	.....	....	....	....	.38	....	....	....	....	....	....	100
Savage, Nev.	....	....	....	....	....	....	....	....	3. 5	....	....	....	100
Sierra Nevada, Nev.	....	.....	4.10	....	....	....	....	....	....	....	....	....	200
Silver King, Ariz.	....	....	....	....	....	....	....	....	....	....	.85	.80	100
Silver Mg. of L. V.	....	.....	....	....	....	.34	....	.35	....	....	.34	....	2,200
Small Hopes, Colo.	....	.....	....	....	....	1.10	....	....	....	....	....	....	300
Standard, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Stormont, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Yellow Jacket	4 05	.....	....	....	3.35	....	....	....	....	....	....	....	200

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	April 20.		April 22.		April 23.		April 24.		April 25.		April 26.		SALE.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alta, Nev	2.35	....	.....	....	....	....	....	....	....	....	2..5	....	200
Amador, Cal.	....	....	1 55	....	....	....	....	....	....	....	....	....	200
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal.	.20	....	.20	....	20	....	20	....	.20	....	.20	....	3,800
Barcelona, Nev.	....	....	....	....	....	....	....	....	.58	....	....	....	100
Best & Belcher, Nev.	....	....	4.50	....	....	....	....	....	4.60	....	....	....	250
Brunswick, Cal.	....	....	....	....	09	....	.08	....	....	....	....	....	1,400
Buffalo Iron Min'g.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bullion, Nev.	1.30	....	1.10	....	....	....	....	....	1.20	....	1.15	....	800
Cashier, Colo	....	....	....	....	.03	....	....	....	....	....	....	....	300
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Colchis, N. M.	....	....	5.00	4.40	5.00	....	....	....	....	....	....	....	1,000
Commonw'th, Nev.	....	....	....	....	....	....	....	....	4.00	....	4 25	3.50	.....
Con. Imperial, Nev	.63	....	....	....	.64	....	....	....	.58	....	....	....	3,20
Con. Pacific	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, U. S. Col.	1.75	....	1.75	....	1 80	1.75	1.70	1.65	1.65	1.60	1 60	1.50	1,600
Excelsior, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer Nev.	1.10	....	....	....	....	....	....	....	....	....	....	....	200
Hector, Cal	....	....	....	....	....	....	....	....	....	....	.25	.20	200
Hollywood, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kossuth, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	.10	.09	.09	....	....	....	10	....	.10	.09	....	....	10,000
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev.	7.50	....	6 63	....	5.63	....	4.70	....	....	....	....	....	550
Middle Bar, Cal.	.31	....	....	....	....	....	....	....	....	....	....	....	500
Moniter, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sm. & M. Co	1.25	....	1.20	....	1.25	....	1.45	....	1.45	....	1 45	....	2,400
NevadaQueen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Commonw., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Oriental & Mil., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix Lead	....	....	....	....	....	....	....	....	....	....	....	....	.....
Potosi, Nev	....	....	....	....	....	....	....	....	....	....	2.20	....	100
Proustite, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahannock, Va.	.08	....	.08	....	.08	....	....	....	....	....	....	....	3,300
Santiago U. S. C.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Scorpion, Ariz.	....	....	.50	....	....	....	....	....	....	....	....	....	300
Shoshone, Idaho	....	....	.07	....	....	....	....	....	....	....	....	....	2,000
Silver Cliff, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Cord, Colo.	.88	....	.89	.80	.80	....	.80	....	.89	....	....	....	*3,825
Silver Hill, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	.....
Scate Line, 2&3, Nev.	....	....	....	....	....	....	.05	....	....	....	....	....	2,100
Sullivan Con	1.30	....	1.35	1.30	1.35	....	1.35	....	1 35	....	1.35	....	4,400
Sutro Tunnel, Nev.	....	....	.09	....	....	....	....	....	....	....	....	....	300
" Trust Cert.	....	....	....	....	....	....	....	....	.57	....	....	....	3,500
Tornado, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Union Cons., Nev.	6 38	6 25	....	....	....	....	....	....	....	....	....	....	300
United Copper	2 25	2 20	2 00	1.40	1 30	1.25	1.15	....	1.15	....	1 10	1.00	1,900
Utah, Nev.	....	....	....	....	....	....	....	....	....	....	1.50	....	200

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 19,904. Non-dividend shares sold, 49,225. Total New York, 69,129.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Apr. 19.*		Apr. 20.		Apr. 22.*		Apr. 23.		Apr. 24.		Apr. 25.		SALES.
Atlantic, Mich.	.....	.....	....	....	.....	.....	....	.....	9.13	9 00	.....	.....	210
Bodie, Cal.	.....	.....	....	....	.....	.....	....	.....	....	....	.....	.....	.....
Bonanza Developm't	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Bost. & Mont., Copper	.....	....	31.00	30.50	....	....	31.00	30.50	31.50	31.0	....	....	959
Breece, Colo.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Calumet & Hecla.	.....	....	210	2 00	.....	.....	210	....	209¾	209¼	209¼	....	421
Catalpa, Colo.	.....	.....	....	....	....	....	....	....	....	....	....	....	.....
Central, Mich.	.....	.....	....	....	....	....	....	....	....	....	....	....	.....
Chrysolite, Colo	.....	.....	....	....	....	....	....	....	....	....	....	....	.....
Con. Cal. & Va., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Dunkin, Colo.	.....	....	....	....	....	....	....	....	.90	....	....	....	400
Enterprise.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Franklin, Mich.	....	....	9.25	....	....	....	9.50	9.25	....	....	....	....	175
Hale & Norcross, Nev.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Honorine, Utah	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Chief, Colo.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Pittsburg, Colo.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Napa, Cal.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Ontario.	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Osceola, Mich.	....	.....	10.00	..	.....	....	9.75	....	10.0	9.75	....	....	152
Pewabic, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Quincy, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Ridge, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nev., Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver King, Ariz.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Standard, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, Mich.	....	....	109	....	....	....	....	....	109	....	109	108	93

NAME OF COMPANY.	Apr 19*		Apr. 20.		Apr. 22.*		Apr. 23		Apr. 24.		Apr. 25.		SALES
Alloues, Mich.	....	....	....	....	....	....	....	....	....	....	1.00	....	50
Arnold, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Aztec, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Boston	....	....	....	....	....	....	....	....	....	....	....	....	.....
Canada	....	....	....	....	....	....	....	....	....	....	....	....	.....
Casnier, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Crescent, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cusi, N. Mex.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, W. S. C.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Everett	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Humboldt, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hungarian	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kearsarge, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mesnard, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
National, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Native, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Pontiac.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahannock, Va.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santa Fe, N. Mex.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Security, Colo.	....	....	....	....	....	....	....	....	.82½	.60	.60	.50	3,077
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	.60	....	.....
South Side, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
St. Louis Cop.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....

*Holidays. Boston: Dividend shares sold, 2,410. Non-dividend shares sold, 3,127. Total Boston, 5,537.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	April 20.		April 22.		April 23.		April 24.		April 25.		April 26.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal.	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Buck Mountain Coal.	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Cameron Coal & Iron Co	....	34¼	33	34¾	34¼	34⅜	31	....	....	34¼	34	34⅜	34	2,220
Ches. & O. RR.	100	....	....	....	....	....	....	....	....	....	....	17¾	17⅝	800
Chic. & Ind. Coal RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Col. & Hocking Coal	100	....	....	....	....	....	....	....	....	....	....	17½	....	100
Col., C. & I	100	23¾	23⅝	24	23¼	23¾	22¾	23¼	22½	24	23½	24¼	24	3,080
Consol. Coal	100	....	....	25¼	25	....	....	....	....	....	....	....	....	200
Del. & H. C.	100	133½	....	135	133⅞	135	134⅛	135¾	134½	136⅝	135⅞	136¾	....	4,017
D., L. & W. RR.	50	137	136½	137⅝	137⅛	137¼	136½	137⅛	136½	137½	136⅞	137½	137⅛	13,732
Hocking Valley	100	20	18	18	16	18¾	17¾	18¾	17¾	19	18½	19⅝	19	13,180
Hunt. & Broad Top	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref.	....	45¾	....	....	....	....	....	45½	....	45¾	....	....	....	215
Lehigh C. & N.	50	51⅜	....	51⅛	51⅜	51⅛	....	....	....	51½	....	....	....	96
Lehigh & W. B. Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Lehigh Valley RR.	50	55⅝	53½	53¾	53⅝	54¾	54⅛	53¾	53⅜	53⅝	53½	....	....	556
Marshall Con. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mahoning Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Maryland Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Morris & Essex	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
New Central Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. J. C. RR.	50	96½	96¼	96¾	96¼	96½	....	96	....	96¾	....	96⅝	96¼	2,819
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Y., Susq. & Western	100	....	....	....	....	....	....	7¾	....	7¾	....	8	....	405
Do. pref.	100	....	....	32¼	32¼	32¼	32	....	....	33	32¼	33⅛	....	1,450
N. Y. & Perry C. & I.	100	....	....	....	....	....	....	....	....	....	....	....	....	.....
Norfolk & Western R.R.	100	....	....	....	....	....	....	....	....	16½	16	....	....	900
Do. pref.	50	....	....	....	....	49¾	49⅜	50⅛	50¼	52½	51¾	53⅜	52¾	5,275
Penn. Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	.....
Penn. RR.	50	54¾	....	54⅞	54⅝	54¾	54⅝	54¾	54⅝	54⅞	54¾	....	....	2,122
Ph. & R. RR.**	50	45½	44¾	45⅝	45¼	45¼	44⅝	44⅝	43¾	45⅝	44⅝	45⅜	45	150,294
Sunday Creek Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Do. pref.	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Tennessee C. & I. Co.	100	39	38½	41⅝	39	51⅞	39½	40⅜	39¾	41	40	41	39¾	21,140
Do. pref.	....	100	....	102	100	101½	....	....	....	....	....	102	....	1,111
Westmoreland Coal	100	.....	....	....	....	....	....	....	....	....	....	....	....	.....
Wyoming Valley Coal	....	.....	....	....	....	....	....	....	....	....	....	....	....	.....

**Of the sales of this stock, 27,891 were in Philadelphia, and 122,403 in New York. Total sales, 223,712.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. April 19.	April 20.	April 22.	April 23.	April 24.	April 25.
Alpha	.....	.....	.....	.....	.....	.....
Alta	2.25	2.13	2.10	2.20	2.10	2.05
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle.	.20	.....	.....	.....	.20	.25
Best & Bel.	5.13	4.55	4.55	4.45	4.55	4.20
Bodie	1.30	1.30	1.25	1.25	1.45	1.05
Bulwer	.30	.25	.25	.....	.25	.35
Challar	3.00	2.65	2.55	2.60	2.85	2.75
C'm'weal'h	5.00	5.00	.....	.....	5.13	5.13
Con. C. & V	9.00	8.13	8.75	8.13	8. 8	5.00
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	4.70	4.40	4.20	4.70	4.85	4.10
Eureka C.	.....	.....	.....	.....	.....	.....
Gould & C.	3.15	3.00	2.85	2.85	3.15	2.85
Grd. Prize.	.....	.....	.....	.....	.....	.....
Hale & N.	5.13	4.75	4.25	4.50	4.90	4.45
M. White.	.....	.....	.....	.....	.....	.....
Mexican	5.88	5 75	5.63	5.50	6.13	4.95
Mono.	1.30	1.30	1.40	1.50	1.55	1.75
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	85	.85	.80	.80	.85	.90
Nev. Queen	2.30	2.00	1.75	1.95	2.25	2.20
N. Belle I.	2.25	.....	2.10	2.10	.....	.....
Ophir.	7.00	6.95	5.75	5.63	5.63	5.38
Potosi.	2.30	2.05	2.00	2.10	2.25	2.10
Savage	3.50	3.30	3.00	3.05	3.15	3.00
Sierra Nev	4.40	4.20	3.80	3.65	4.20	3.80
Tip Top.	.....	.....	.....	.....	.....	.....
Union Con.	6.50	6.25	5.50	5.38	6.38	4.95
Utah.	1.70	1.55	1.50	1.45	1.60	1.40
Yellow Jkt.	4.15	3.50	3.10	3.50	3.75	3.35

scrap iron. There is no change in prices, which will be found in our list of current quotations.

PITTSBURG. April 25.

[From our Special Correspondent.]

Raw Iron.—The past week has presented little that is either new or important. Sales made since our last seem to be down to the lowest point. We know of parties who could have disposed of several thousand tons, provided concessions were made, which were refused, as the owners considered good iron, at present prices, about as good as cash. At all events, they have set prices, which they propose to obtain, if they have to wait all summer. There has been an increased demand for Bessemer. A number of good sized blocks have changed hands within a short time, with negotiations pending for others. Notwithstanding the talk of a dull market at the end of the week, when sales are put together they show a good business in the aggregate. The railroads have been doing the Mahoning and Shenango Valley furnaces a good turn by reducing freights on pig iron 15 cents per ton and, as usual, Pittsburg iron men are left out in the cold, this decline in freights giving the valley furnaces an advantage to that extent. Pittsburg merchants and others have been imposed upon by the railroads to such an extent that the wonder is what will be the next move.

The usual midsummer suspension of work will surely decide the question of an improvement in prices. If they have not rallied by that time the shut-down will be longer than usual. Once the mills stop work they will be in no hurry to resume, unless with some chance of profit.

Coal and Coke Smelted Lake Ore.	
2300 Tons Bessemer	16.50 cash.
2300 Tons Bessemer	16.50 cash.
2300 Tons Bessemer	16.50 cash.
1500 Tons Bessemer	16.25 cash.
1000 Tons Bessemer	16.25 cash.
1000 Tons Bessemer	16.25 cash.
1000 Tons Gray Forge	14.25 cash.
750 Tons Gray Forge	14.00 cash.
100 Tons No. 2 Foundry	15.50 cash.
100 Tons No. 1 Foundry	16.25 cash.
Coke, Native Ore.	
500 Tons Gray Forge	14.50 4 mo.
100 Tons Gray Forge, all ore	15.65 cash.
50 Tons No. 2 Foundry	15.50 cash.
50 Tons No. 1 Foundry	16.25 cash.
Charcoal.	
75 Tons No. 2 Foundry	22.00 cash.
50 Tons Cold Blast	27.75 cash.
Muck Bar.	
1500 Tons Neutral	26.25 cash.
500 Tons Neutral, May	27.00 cash.
500 Tons Neutral	27.00 cash.
Steel Slabs and Billets.	
600 Tons Nail Slabs	27.50 cash.
500 Tons Billets	28.00 cash.
700 Tons Billets	28.00 cash.
Bloom Ends.	
350 Tons Bloom Ends	18.00 cash.
Ferro-Manganese.	
75 Tons 80 per cent	59.00 cash.
Spiegel.	
50 Tons 20 per cent	31.00 cash.
50 Tons 10 and 12 per cent	27.50 cash.
Old Iron Rails.	
500 Tons American Tees	22.50 cash.
450 Tons American Tees	22.75 cash.

CHEMICALS AND MINERALS.

New York, Friday Evening, April 26.

Heavy Chemicals.—The events of the week, such as they are, do not tend to cheer "heavy" chemical importers and brokers. The lack of demand is the very sufficient cause for the prevailing dullness. Although sales for the past month, as a rule, have not been large, it now appears that consumers have purchased enough to last them for some time to come. Importers have all along been urging their customers to take advantage of the low prices, and as a number of them appear to have been doing so, they are not likely to immediately require supplies. Consequently, a more serious crisis than ever appears to have been reached, and dealers are not able to hope for much relief from an increased demand for consumption.

News concerning the action of the caustic soda maker's association has been meagre this week, but we learn from authoritative sources that no agreement has yet been reached and, owing to the dissatisfaction of one important English manufacturer, even the continuance of the association is doubtful. Despite these rather demoralizing reports, the latest cables report prices firm at last week's figures. Local dealers have accordingly endeavored to maintain their end of the line, and we get quotations of 2·17½@2·20c. for all the higher tests. We are informed, however, that in certain quarters an actual order at 2·12½c. would be accepted. Outside of store, stocks are not generally large. Sixty per cent, outside of a very few jobbing sales, is moving only on contract.

Bleaching powder has not materially improved. We learn of the disposal of a round lot at 1·57½c. This was to an agent or middleman, however, and we get no quotations for consumers lower than 1·60@1·65c. In a jobbing way, say in two, five or ten cask lots, sales are reported at 1·75@1·85c.

Caustic soda ash, 48 per cent, is apparently a little weaker. A portion of a considerable quantity which was offered nearly three weeks ago for arrival on April 30th can still be had at 1·17½c. ex ship.

Carbonated soda ash, 48 per cent, continues in good demand, but as the glass-making season approaches its end, consumption will naturally decrease, and it cannot be said that the outlook is for higher prices for this article.

Sal soda is quiet at ·90@1c., according to quantity.

Acids.—It is a steady and uninteresting sort of a trade which is now being transacted in this market. It is sufficient to say that prices are absolutely unchanged. Trade is quiet and light, and the week, so far as news is concerned, is featureless. Acetic is moving slowly in the neighborhood of 2c.; nitric is perhaps in slightly better request at 4@5½c. for 36°; muriatic is quiet at 1·10@1·20c. for 18°, and sulphuric is in fair demand at ·95c. for 66°.

Fertilizing Chemicals.—A rather dull feeling prevails in this department, and prices are rather weak. Otherwise, the market present few features of interest. Asking prices are as follows: Azotine, $2.60@$2.65; dried blood (city), low grade, $2.55@$2.60 per unit; Western, high grade, $2.65 per unit for ground material; tankage, high grade, $26 per ton; low grade, $23 per ton, as to quality. Fish scrap, $25@$26 per ton f.o.b. factory. Sulphate of ammonia, $3.25@$3.32½ per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, $19.50 per ton. Dissolved bone-black is 95c. @$1 per unit for available phosphoric acid, and acid phosphate 80@85c. per unit for available phosphoric acid.

Steamed bones, unground, $20; ground, $25@$26.

Charleston rock, undried, $5@$5.25 per ton; kiln dried, $6@$6.25 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, $10.50 ex steamer at New York.

Muriate of Potash.—In consequence of the prevailing dullness, prices on the spot have weakened to 1·80c. for say 50 ton lots; small quantities from store are still held as high as 1·87c. Shipment is quoted at 1 80c. We are reported for the week only one arrival, the S. S. Taormina, which brought 1842 bags, or 408,000 pounds. Sales of 100 tons in jobbing lots have been made.

Double manure salts, basis 48 per cent, is quiet at 1·20c. spot and 1·15c. for shipment. High grade sulphate of potash, basis 90 per cent, continues at 2·40c.

Kainit.—Arrivals for the week aggregate 920 tons. Quotations at the moment are $9.25 for shipment and $10 75 per ton ex-store.

Nitrate of Soda.—Two vessels have brought cargoes aggregating nearly 15,000 bags this week. There has also been considerable pressure to sell from various quarters and the quotation of 2·15c. on the spot is now very general.

Brimstone is offered at $20@$20.25 for best unmixed seconds on the spot. Transactions are light.

Canadian Phosphates.—Our correspondent at Montreal writes us under date of April 24th as follows: We have to wait advices from England before quoting prices for Canadian Phosphate for delivery in the United States or Canada, our quotations being based upon what buyers will give for the material in England and on the Continent. Very small quantities of ground or unground phosphate have, up to the present time, been shipped to the United States, but we look for a large demand from there in the near future. Our London, England, house, Messrs. Couper, Millar & Co. (late Couper, McCarnie & Co.) write us under date of 6th inst., as follows:

"Prices here are about 11¼d. to 12d. for 80 per cent guaranteed London terms, and we are asking 10½d. with rise for 70 per cent. For Somme, 70 per cent, 12d. per unit is asked, but no buyers. Lower grades of Somme we are selling as follows: 60 per cent at 9d. with rise, and 55 per cent at 8¼d.

The Canadian Phosphate Company, Limited, will commence shipping a quantity of our ore to Europe very shortly, as navigation on the St. Lawrence River is now open and the first ocean craft expected to arrive here to-morrow.

Arrivals.—We are reported the following late arrivals: Arsenic, 500 pounds, by S. S. "Brooklyn City," from Glasgow; 12,310 bags nitrate of soda, by S. S. "Amanda"; 34 casks oxalic acid by S. S. "Newcastle," from Glasgow; 518 drums caustic soda, and 150 casks bleaching powder by S. S. "North Durham," from Newcastle; 250 casks soda ash by S. S. "City of Chicago," from Liverpool; 380 drums caustic soda by S. S. "Celtic," from Liverpool; 182 casks caustic soda, 362 casks alkali and 210 casks bleaching powder by S. S. "North Durham," from Newcastle.

Liverpool. April 13.

[From our Special Correspondents.]

Chemicals.—Messrs. J. P. Brunner & Co write us as follows: There is little stirring in heavy chemicals, and in the case of caustic soda the position is weaker, owing to dissensions among makers. A meeting of the caustic soda manufacturers, convened by one of the makers who is dissatisfied with the present basis of make arrangement, was held here on the 9th inst. After a protracted sitting the meeting was adjourned with practically no result. We understand that the matter has been left to the committee to try and arrange matters, but the situation is unsatisfactory, and it looks as if further trouble was in store for the association. Soda ash—Caustic ash is very dull, but carbureted ash is firm, and little to be had for early delivery. We quote: Caustic ash, 48 per cent, 1⅛@1⅛d.; high test, 1⅛@1⅛d. Carb. ash, 48 per cent, 1⅛@1⅛d.; high test, 1@1⅛d. Soda crystals are difficult to move, and £2 8s. 9d.@£2 10s. are nominal quotations, while the lower quotation could probably be shaded for quantity. Caustic soda has gone very flat, owing to reasons stated above, and resales of 70 per cent have been made at £6 12s. 6d. down to £6 11s. 3d. Makers generally hold for 2s. 6d. above the higher figure named. Sixty per cent is still scarce, and quoted at £5 15s. to £5 17s. 6d. Seventy-four per cent has been done at £7 2s. 6d., while some makers hold for 2s. 6d. more money. Seventy-six per cent steady at £8 10s. Bleaching powder is less firm for hardwood, and prices are irregular at £6 15s. up to £7. Several transactions for America have taken place at the lower figure. Chlorate of potash inanimate at 4¾d, and possibly a shade less would be accepted by resellers. Bicarbonate of soda in good request at £4 12s. 6d. to £4 15s. per ton for 1 cwt. kegs, according to brand and quantity, with usual allowances for larger packages. Sulphate of ammonia steady at £11 17s. 6d. to £12 for good gray 24 per cent. and little offering for early delivery.

BUILDING MATERIAL MARKET.

Friday Evening, April 26, 1889.

The Building Material Exchange will be closed on Monday, Tuesday and Wednesday of next week on account of the Centennial celebration. This holiday of a half-week's duration, will be the longest enjoyed by any of the New York exchanges.

Bricks.—The long-continued shipments of old brick have now begun to tell upon the yard supplies, which, by the way, have lasted unexpectedly long, and receipts this week have been considerably less than last. This fact, together with a steady demand, has enabled receivers to sustain prices very nearly at the old figures. Furthermore, were it not for next week's interruption of business, it is probable that the supplies at primary points would become so depleted that holders might be able to secure still higher figures. Very little new brick is expected until the second week in May, and judging from former seasons, no very great supply will be received until very nearly the first of June.

Building Stones.—The demand for building stones has hardly begun to be felt yet, and at present we are unable to record much animation. Building projects this year include a number of large office buildings and other important structures, and it is hoped that a large amount of stone will be used. The new Protestant Episcopal Cathedral uptown is a subject of especial interest to local agents of quarries. The trustees of the Cathedral have selected Prof. Wm. R. Ware, of Columbia; Prof. Charles Babcock, of Cornell, and John Bogart, the superintending engineer of the Washington Bridge, as a committee of experts to assist in the selection of plans, and their choice is anxiously awaited.

The movement in lime and cement continues as reported last week with no important variation in prices.

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